California State Journal of Medicine

ISSUED MONTHLY OWNED AND PUBLISHED BY THE

MEDICAL SOCIETY OF THE STATE OF CALIFORNIA

Vol. XVIII, No. 3 MARCH, 1920 $1.00 a Year

CONTENTS.

(Contents continued on page IX.)

ENTERED AT SAN FRANCISCO, CAL. AS SECOND-CLASS MATTER

FRED I. LACKENBACH, Biologic Depot

BACTERIOLOGICAL, SERIOLOGICAL AND CHEMICAL WORK

9th Floor Butler Building — SAN FRANCISCO — 135 Stockton Street

Telephone Sutter 3122 — Telegraph "SERUMS" San Francisco

California State Journal of Medicine

OWNED AND PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE STATE OF CALIFORNIA
BUTLER BUILDING, 135 STOCKTON STREET, SAN FRANCISCO

Secretary - - - - - - - - - - SAXTON POPE, M. D.
Editor - - - - - - - - - - ALFRED C. REED, M. D.
Managing Editor - - - - - - - - - CELESTINE J. SULLIVAN

VOL. XVIII MARCH, 1920 No. 3

IMPORTANT NOTICE

Make your reservations at once with Hotel Ambassador, Santa Barbara, for the Medical Society State of California meets May 11th, 12th and 13th, 1920.

STATE SOCIETY

At the last meeting of the Council, held January 24th, among other matters of a routine nature, the forthcoming annual meeting of the Medical Society of the State of California was discussed at length. The change of location from Del Monte to Santa Barbara was confirmed by a unanimous vote. It was also debated whether or not the date assigned for the meeting suited the occasion. It seems now that eastern tourist travel has greatly increased and filled the southern hotels to overflowing. It was hoped that by changing the date from April to May we would avoid this situation, but unusual conditions of travel have rather increased the difficulty. This change of date was made at the instigation of the hotel managers, but it seems that no time is opportune now for large gatherings in tourist hotels. The change of the date of the meeting of the American Medical Association in New Orleans also conflicts to some extent with our State Medical Society meeting. The New Orleans convention was set for a month earlier than usual owing to the intense heat which occurs in June.

As yet no rates have been quoted by the hotels in Santa Barbara, and no doubt the changing conditions of industry and economics render it very difficult for hotel managers to assign rates very far in advance. There is one assurance that we can depend upon—they will be high enough to satisfy the most extravagant.

At the request of the secretary, the Council appointed Dr. Joseph Catton as an assistant without salary, and to him was assigned the duty of supervising the preparation for the State Meeting. In accordance with a resolution adopted by the House of Delegates last year the State Secretary was appointed chairman of the Program Committee and the chairmen of the various sections are expected to report to this committee and work in co-operation with it. Dr. Catton will be especially assigned to this work, representing the Council. Every effort will be made to assure the Society of a successful and instructive convention. The scientific features of the program are of the highest type and many new problems in medicine will be presented for consideration.

Further details of rates and reservations will occur in the program which will be printed as usual in the CALIFORNIA STATE JOURNAL OF MEDICINE prior to the general meeting.

It is to be regretted that many papers on timely subjects and of more than excellent merit have had to be refused a place on the program because they were not presented before the time limit, which was December 31st, 1919. Because of the great number of papers presented to the Committee on Program each year, it was necessary to place a date after which no papers could be

accepted. There have been a great many more applications for room on the Medical and Surgical Programs than the time allotted will permit.

CHARITY SHOULD BEGIN AT HOME

In the San Francisco *Examiner* of February 18th, 1920, appears the following clipping:

"A marriage license was issued yesterday to Miss ———— and Mr. ————, Christian Science practitioner of this city. The wedding will not take place for some time because of illness in the family."

AN APPRECIATION

Years pass swiftly; fleeting events come and go. The problems of yesterday are forgot in the exigencies of to-day. With the passing of the problem, we are liable to forget the man behind it. Therefore, let us take time to say a word of appreciation of those who have broken trail for us in the progress of medicine, and packed the burdens whose benefits we now share.

The Medical Society of the State of California has been built up by the hard labor of successive champions in the cause of better medicine. These men and women have had idealism; they have been activated by steadfast purpose and have spent their life's energy in our behalf. Where others were indifferent and neutral, these leaders forged ahead and bid us follow. They led the fight against disease, ignorance and vice. They wrought the machinery for preventive medicine. They educated and coerced the public into better sanitation and personal hygiene. They built up the laws and ordinances which make for higher medical standards and eliminate quackery. We reap the benefit of their pioneer industry. We saw them at work; possibly, we differed with them over methods and means of achievement; mayhap, we scoffed at their efforts. Nevertheless, we have been blessed by the fruits of their labor. They were vital; they did not spare themselves. But now the spark has gone and the flame grown dim. We see them pass. In passing let us doff our hats and do them homage.

You who have served—you have given what cannot be lost. For the good you have done, we now offer you our gratitude.

You are among the Immortals.

AUTOMOBILE FOR NURSE.

The enterprise of Hayward, which claims to have the model public health center of the State, offers a valuable suggestion to the other communities.

Miss Olive Schafer, the public health nurse, has visited hundreds of families in Hayward and vicinity. She walked because she had no better means of transportation. She reached all classes making hundreds of personal examinations, touching children's dental defects, vision, etc., and leaving valuable lessons behind in home sanitation.

A great deal of the nurse's valuable time, however, was used in traveling from place to place. This was observed by enterprising citizens of Hayward and it was decided to buy an automobile for the use of Miss Schafer. It has just arrived, and Hayward is so convinced of the value of public health nursing that a drive to raise funds to provide an additional nurse has been started.

This action and attitude are in such happy contrast to the culpable parsimony of Boards of Supervisors and City Trustees, in some of our communities when discussing and deciding public health questions, that it is recommended to them for emulation.

UNINTENTIONAL MISDEMEANOR OF HOSPITAL SUPERINTENDENTS AND PHYSICIANS.

Some hospital superintendents and a few physicians fall into unintentional misdemeanors in their zeal to serve their patients. Section 224 of the Civil Code, Chapter 569, provides that the placing of dependent children in homes for adoption is under the supervision and control of the state Board of Charities and Corrections. Overlooking this plain provision of the law, some place newly born infants directly into foster homes without informing or securing a license from the state Board of Charities and Corrections.

This violation of the law, despite the good intentions of the violator, may seriously jeopardize the interest of the defenseless child and in practice frequently does.

The physician or hospital superintendent feels that he knows the receptive foster parents very well, and yields to their request to find them a baby for adoption. The child appears and is disposed of, and the Doctor has a feeling of elation that he has found a good home for a possible waif.

But the Doctor is too busy to see the adoption through to a conclusion, and has not the facilities to find out whether all the necessary legal steps are carried out.

It has frequently happened that through this neglect of legal procedure the child has never been legally adopted, and its rights and that of its foster parents are not safeguarded.

The State Board of Charities and Corrections has licensed a number of Agencies to place children into homes. These organizations have the machinery necessary for the proper investigation and supervision of children placed in homes. Two of the organizations doing state-wide work along these lines are the Native Sons and Daughters Central Committee on Homeless Children, headquarters 995 Phelan Building, San Francisco, and the Children's Home Society of California, headquarters 2414 Griffith Avenue, Los Angeles; branch office, 64 Bacon Bldg., Oakland. These and other agencies authorized by the Board will safeguard the interests of the child, the natural and foster parents, and their work is free from undesirable publicity.

The JOURNAL feels confident that all that is necessary to secure uniform compliance with the law is to call this important matter to the thoughtful attention of the Doctors. As the measure is definitely designed to protect and conserve the childhood of the State, the efforts of the State Board of Charities and Corrections always receive our hearty co-operation.

"DID WILEY EVER PRACTICE MEDICINE?"

To the JOURNAL office has come a circular which we here reproduce, together with the note which accompanied it from the member who sent it. This circular is some "hooray" for the W. C. T. U. of California, we take it.

WHISKY BANNED AS MEDICINE

Dr. Wiley Declares It Will Only Hasten Patient's Illness In "Flu" Cases

St. Louis, Jan. 30.—(By Universal Service).—Whisky and brandy have been eliminated as medicines, it was declared here today by Dr. Harvey W. Wiley, president of the United States Pharmacopeial convention, and former chief of the Bureau of Chemistry, Department of Agriculture. No mention of alcoholic liquors as medicines will be made in the next issue of the American Pharmacopeia, which is prepared every ten years, he said. This was determined upon several years before national prohibition became effective.

Whisky, instead of an effective remedy or preventive for influenza, is a positive poison in such cases, said Dr. Wiley, adding:

"In only one instance would I use whisky for an influenza case, and that would be where I wished to hasten the departure to Heaven of the patient."—S. F. Examiner.

Issued by the
W. C. T. U. OF CALIFORNIA
3 City Hall Avenue
San Francisco

"Did Wiley ever practice medicine? Think of the president of the U. S. Pharmacy Convention getting into class with the Chinese 'doc' who says flu patients are killed only by chicken broth and eggs."

NURSES NEEDED.

"What are we going to do to get more nurses?" This question has been asked of the JOURNAL in written and various verbal forms so often, that we decided to place the question before all our readers instead of continuing to answer it privately and piecemeal.

That there is a shortage of trained nurses, and nurses in training, is generally felt. The medical profession is the first to feel this need and appreciate its seriousness, but it is a matter of concern to every hospital and to every citizen and family of every community.

Who will say that he or she or members of their family may not need a trained nurse today or tomorrow?

In untrained hands even the most skilful physician will not willingly and cannot safely leave his patients. We will not, therefore, attempt to forecast the menace to public health, and the heavy handicap it will impose upon the Doctor, when this present need of nurses grows greater, the number of nurses fewer, and the situation becomes more acute.

What's the cause? As the first step to finding out some of the reasons we have asked this question of many who are wrestling with the problem. From the answers given we condensed the following: 1. Too high requirements for entrances and for graduation. 2. The great expense necessary for such training. 3. Training course too long. All essential information and practical work could be fully mastered in two years. 4. Too much menial work that does not materially assist nurses' development in skill. 5. High cost of living, and the commercial field offers more attractive opportunities in the way of larger salaries, shorter hours and more pleasant environment. These are among the chief causes assigned.

At this time we shall not undertake to place the responsibility or suggest definite remedies except to say that a plan that does not seem to work well in practice might well be revised. It is unnecessary to speak of the great field of service that the trained nurse enters. The high conception of nursing as a profession is too well known to require comment. The real nurse treasures and the public appreciates the immeasurable difference between commercial work, in which the employer gets what he pays for, and the professional service, which can never be measured by money.

One of the gains of the war was the revival of the spirit of service and self-sacrifice. With regard to the nursing profession this was eulogized in dramatic prose and epic poem. The nurse was pictured as the greatest mother of the world—greater even than those who gave up their sons for humanity.

The war nurses are not letting their well-won laurels wither, but the high tide of service seems to be ebbing and worthy successors "with this regard their currents turn awry and lose the name of action."

The cause may lie in a combination of the reasons above assigned, and the remedy in changing conditions that may be changed without impairing the efficiency of the service. It must be conceded that when we have not enough nurses for normal needs, we are poorly prepared for emergencies.

This need which prevails in the larger cities is doubly emphasized in rural communities. Were it not for public health nursing, and the splendid and combined efforts of such organizations as the Red Cross, the Salvation Army, the various Welfare Boards of Churches and lodges the situation would be extremely alarming.

It has been suggested that there are many types of work in the private rooms and wards of a hospital that could be done as well or better by hospital maids, and the nurses' time and strength saved for more skilful work. There is much work that does not require long practice or training in order to do it satisfactorily. Hospital maids would be more readily available than nurses, and, supervised by nurses, the service to the sick would not be reduced but the cost would.

HANFORD STOPS SPITTERS.

Hanford's way of stopping spitting is to make it expensive. It will cost you $300.00 per spit, if you're caught spitting on the sidewalk in Hanford. Handkerchiefs cost only two bits, so it is cheaper to use handkerchiefs than spit on the sidewalk in Hanford. Professional baseball has outlawed "spitters" after this season. But that isn't Hanford's way. When Hanford decided that spitting was a menace to its public welfare, it prohibited spitting, and the law is being rigidly enforced. Hats off to Hanford.

The effective action taken by the Board of Trustees of the City of Hanford to suppress spitters, should commend itself to the other cities of the State, particularly to San Francisco, Los Angeles, Sacramento, Oakland, and San Jose. The city fathers of Hanford have announced through press and poster that those who go hawking along the streets, voiding their rheum and spreading bacteria to the right and left, are not only ill-mannered but ill-producers.

Most cities, like Hanford, have ordinances declaring it to be a misdemeanor for any person to spit or expectorate on the floor of any public building or on any sidewalk within the city limits. Yet every hour of the day and far into the evening, you see a parade of spitters phlegm-flamming the public.

The danger of infection from the dust of sidewalks, streets and buildings is immeasurably increased by spitters; the hazards of shopping, theater and church-going are multiplied by sneezers and coughers that must have buried their manners as well as talents in an only handkerchief. It is time for them to purchase another one and use it.

The action of Hanford in keeping its sidewalks and public buildings clean from the saliva of the thoughtless and inconsiderate, besides being a splendid disease preventive measure, makes the city more attractive as well as sanitary. Public sentiment in Hanford is strongly behind the Board of Trustees, and the public sentiment of every community of California will uphold its officers in enforcing laws for the suppression of customs and the prevention of conditions that endanger public health. Competent health officers can appeal with confidence to the common sense of any community to support health measures for the common good.

BOTULISM.

Particular attention is directed to the special article in last month's JOURNAL on botulism by Dr. E. C. Dickson. This subject is of very timely importance because of the wide newspaper notoriety it is now receiving due to the number of outbreaks of the last few months in widely separated parts of the United States. Botulism has been recorded more frequently in California probably because more constant search has been made for it, although possibly because its incidence may be higher on the Pacific Coast.

Not only is botulism a form of meat poisoning, but it has arisen from the use of home canned products, both vegetables and fruits, in various parts of the country. Human cases from home-canned foods have recently been reported in New Jersey, Indiana and Idaho. Forage poisoning cases in animals have been reported in Kentucky and Illinois, all together indicating the wide distribution of bacilli botulinus.

Recent outbreaks from home and factory packed olives have attracted much attention, largely because of the wide publicity accorded them in the newspapers. Equally important and more numerous outbreaks have occurred on the Pacific Coast with only local interest aroused because they did not attract newspaper attention.

An interesting feature of this disease is the high incidence of limber-neck in chickens. Many instances are recorded where from a dozen to fifty were killed. Recently, at Saratoga, California, several hundred thoroughbred chickens were killed by eating discarded home-canned food. In this case representing a loss of several thousand dollars. The high incidence of forage poisoning in horses and mules is also attracting attention. Cases of forage poisoning have been reported in California and are now being investigated by the Department of Agriculture of the University of California. Investigation of botulism began on a large scale in 1913 as a result of a serious outbreak in a sorority house banquet at Stanford University. Since that time this investigation has been carried on in the laboratories of the Stanford University Medical School, and for the period of the war aid was given this research by the State Council of Defense. Important facts have been demonstrated as a result of these studies.

Bacillus botulinus may grow and produce virulent toxin in vegetables and fruits, whereas it was formerly considered to be a meat poisoning exclusively.

Bacillus botulinus is a not infrequent cause of spoilage in home-canned fruits, and frequent deaths have been caused by eating or tasting infected material which had not been heated after removing from can or jar. The toxin of bacillus botulinus is destroyed by heat, wherefore any food is safe if boiled before eaten. The spores of bacillus botulinus are much more resistant to heat than was formerly believed, and they will stand many of the disinfecting processes by which canned foods are supposed to be sterilized. It has been shown also that there are at least two strains of bacillus botulinus as tested by toxin-antitoxin experiments. The toxin of strain A is unaffected by the antitoxin of strain B, and vice versa. This is a matter of the highest importance in treatment where a polyvalent serum must be used. Mrs. Burke, working in the Stanford Laboratories, has shown that the organism may be recovered from nature, from bird-picked cherries, leaves of beans, etc.

Owing to the recognition of the importance of botulism as a type of food poisoning associated with canned foods, a sum of money has been raised by the olive growers and the canning industry for the intensive study of botulism in California. This investigation will be conducted in the laboratories of the Stanford University Medical School and the George W. Hooper Foundation of Medical Research of the University of California. It has the co-operation of the United States Public Health Service and the California State Board of Health.

This investigation will include a careful study of the distribution of the bacillus botulinus in food and the ways in which food material may become infected, and of the steps necessary to destroy the organism when it has infected raw material. It will also include studies of the pharmacology and therapeutics of botulism. A staff of specially trained workers have been engaged and it is expected that the work will require at least two years.

Special Article
Hospital Service Department

THE ORGANIZATION AND MANAGEMENT OF HOSPITALS.

By W. E. MUSGRAVE, M. D., San Francisco.

There are four fundamental types of hospital organization and management:

(a) Municipal, City or County hospitals;
(b) Federal Government hospitals,
(c) Private hospitals,
(d) Corporations.

There are, of course, several varieties of each of these types; varieties in the efficiency, methods of selection and duties of the governing bodies, as well as variations in the powers and duties of the chief executive officer.

Municipal hospitals are extensive and expensive parts of State and municipal governments in all parts of the United States. Considered from an efficiency or community service standpoint, the vast majority of them are about on a par with other municipally operated public utilities. Too few of them may be pronounced excellent and too many are not a credit to the communities they are supposed to serve.

It is interesting to note the extensive discussion of the advisability of municipal control and operation of water works, street cars, railroads, telegraph lines and other comparatively simple public utilities —simple at least when compared with the vastly more difficult and complicated public utility of *health,* which so many communities undertake to operate with fewer facilities and less preparation than they have for operating other utilities, because they have not the aroused interest in public health that they have in less important utilities.

Few citizens in our busy and prosperous cities stop to realize that there is now invested nearly two billions of dollars in institutions of this kind in our country and that it takes a sum of money equal to an annual tax of more than two dollars for each man, woman and child to support them.

BED COSTS $4000.

Even in California, with its more than four hundred hospitals, including her full share of municipal institutions, not enough of the citizens realize that the problem, even when considered solely from a business and financial standpoint, is one of the largest, and certainly the most important, because it is rapidly developing and must continue to grow. Too few people realize that each new bed is added to those now available at an average first cost of $4000.00, which absorbs the earnings on $80,000.00. In addition to this, the normal income on some $25,000.00, or the tax income from over $60,000, must be appropriated annually for the maintenance of each such bed during the life of the institution. If more people gave this subject the careful, serious consideration that is given when other public utilities are under discussion, the present methods of building, managing and supporting many municipal hospitals, as well as the character of service they are rendering, would be revised.

SPIRIT OF SERVICE.

Even in California too many of our county or local government hospitals are required, in addition to their regular function of ministering to the sick, to care for the indigent, the aged and infirm and the criminal insane. Some of them are without many fundamental requisites for good medicine or even of good housekeeping. Above all and most important of all, that sympathetic Spirit of Service which means so much to every sick person is not developed as it should be.

It may be that these things, and many more that might be mentioned, are not inherently bound up in municipal management of hospitals, but no other ready explanation appears.

With a Nation-wide Hospital Betterment movement now well under way and growing constantly, it is well for thinking officials and other citizens to take more interest in the hospitals of their communities, and particularly those supported by taxation. The fundamental question is, whether the complex and expensive public utility of hospital care of the sick is more successfully and economically managed by local government machinery than it would be by charter and supervised contract with corporations or associations organized along special lines and having special facilities for such a service and caring for municipal beneficiaries at so much per day's service.

FEDERAL GOVERNMENT INSTITUTIONS.

Federal Government Institutions differ fundamentally from county or municipal hospitals in that their management usually is vested in one person, a specialist in the field, and who is responsible to some department for the success of the plant. Some of these hospitals are among the best, and failure to hold up standards and maintain efficiency leads to a change in executive head.

However, in many of these hospitals the spirit of helpfulness and sympathy so necessary to the sick is hard to maintain, and in some of them the incentive to do better medicine and a constantly higher type of public service is not as prominent as it should be.

PRIVATE HOSPITALS.

The Private Hospital is somewhat like any other private business and usually is operated for profit. Because of this fact, such hospitals rarely achieve the spirit of community service which means so much to the sick and their friends. The even more dangerous tendency to commercialism must be constantly combated by the person or group making an honest effort to operate a good private hospital. There are some splendid private hospitals in some of our larger cities, and when properly equipped and conducted they may be both a credit and an asset to a community. However, this type of organization, in unsafe hands, lends itself admirably to exploiting the sick and capitalizing their illness and credulity; while irregular and questionable practices reach their greatest perfection in institutions of this kind.

In its work over the State, the Committee of the League for the Conservation of Public Health has surveyed private hospitals deserving of high commendation. Some of them are well equipped, well personneled, with good staffs and technical help; have good buildings and ample equipment. They are offering to the medical profession oppor-

tunities and facilities for doing better work and to their communities a great reduction in health hazards.

Private hospitals of this class feel and accept their part of a community responsibility in the care of those unable to care for themselves, and are entitled to point with just pride to the fact that a goodly share of their earnings are paid in dividends of service to the less fortunate.

Unfortunately there are too many so-called private hospitals that have no such vision, and they may not be credited with the highest intentions or service. In some instances their privacy is used as a kind of smoke barrage to disguise incompetency or what not, which could not continue to propagate if hauled out into the open. Some of these so-called hospitals are dirty, badly designed firetraps without adequate equipment, personnel or other facilities for doing good work. Some of those better constructed and equipped make their work so coldly commercial that the patient seems to be an exotic in their wards.

When private profit-making hospitals are owned by physicians, there is danger of criticism that the thought of dividends may at times be influential in prolonging the stay of patients, unnecessary charges or the glossing over of poor service. There is no foundation for such criticisms in the majority of instances, any more than there is when a pharmacy is owned by a physician, but in both instances there exists the *opportunity* to criticize, and this is sufficient to insure a regrettable amount of it. Furthermore, there is just enough of truth in the situation in some hospitals to make it easy for all to be included by destructive critics.

On the other hand, there are undoubtedly certain advantages to physicians in being interested in their hospitals. The connection insures loyalty, co-operation and tangible assistance in the work of the hospital, not always easy to secure and hold when the only excuse for loyalty and co-operation consists in the opportunity to do a large amount of free work, often without adequate facilities and with no hope of recompense.

This phase of hospitals is discussed quite frankly because of frequent requests from physicians for an opinion upon the subject.

GOOD HOSPITAL ORGANIZATIONS.

Corporation management, with Boards of Directors representing stockholders, university, church, society or some other interest, constitutes the basic plan of the majority of good hospital organizations. This is the usual organization of business. Membership on the board of directors ought to be broad enough to satisfy hospital requirements as well as the various community interests, and the executive functions should be centralized as nearly as may be in the hands of one of its members, limiting the activities of the board as a whole to outlines of policy and questions of moment.

The principal difficulty with this form of organization is in non-attendance at meetings and lack of interested effort on the part of individual directors. It is an amazing fact, all too frequently seen, that members of hospital boards of directors give indifferent attention to their responsibilities, which may be many times greater economically and publicly than some small business of another type which will have their services, study and attention.

The advisability of physicians as members of hospital boards already is answered in the discussion of the private hospital organization. Public health officers and physicians not engaged in practice are especially valuable members of governing bodies and each community service hospital is benefited by numbering one or two upon its board of directors.

An exceedingly prevalent fault with hospital boards is, that they are too large. Seven members should be considered the maximum, unless the organization provides for an executive committee of three or five members with very extensive powers. Large boards with loose organization and numerous committees dealing with all sorts of hospital problems are no more suitable for a hospital than they would be for a bank or a department store. Such a body acting in an advisory capacity to a smaller administrative council has much to commend it in communities where the hospital function must be discharged to the satisfaction of a multiplicity of interests.

Original Articles

NEURO-OTOLOGY: ITS RELATION TO GENERAL MEDICINE.*

By FRED C. LEWITT, M. D., San Francisco.

Any investigation which adds to our knowledge of the function or anatomy of any part of the body is of value. When the knowledge thus obtained aids us clinically and can be applied with benefit to our patients, it becomes of the greatest importance, not to a few, in some special work, but to all. Of such value is the work that has been done in the investigation of the relation of the internal ear to the central nervous system. To this study has been given the name "Neuro-otology." This study has not only added to our knowledge of the anatomy and physiology of the internal ear in its relation to the central nervous system, but has also given us the means of obtaining data, valuable from a diagnostic point of view, in the examination of our patients.

While neuro-otology is primarily a study of the vestibular portion of the inner ear, and its pathways through the brain, its value, by the practical application of the data gained from the examinations, is being appreciated more and more both in medical and surgical diagnosis.

We know that the inner ear consists of two divisions which have separate functions—the cochlea which is concerned with hearing, and the static labyrinth which is concerned with equilibrium. The auditory function of the ear has been known since the beginning of medicine. It has only been within the last half of the last century that we have come to appreciate the role the internal ear plays as the chief organ of equilibrium.

It was through the work of such men as Purkinje, Flourens and Ewald that the relationship between the static labyrinth and equilibrium was first known. Later this work was further advanced by the work of Meniere. To Barany

* Read before the meeting of the Pacific Coast Oto-Ophthalmological Society, San Francisco, August 4, 5, 6, 1919.

of Vienna however, goes the honor of placing the knowledge gained from this work in a position of practical and useful value to the otologist. But to Isaac H. Jones and those working with him in Philadelphia, goes the honor of working out the separate pathways of the canals through the brain stem, and so standardizing the methods of examination and so simplifying the interpretation of the results thus obtained that the work is no longer, to use a borrowed expression, "terra incognita."

We are all familiar with the two reactions resulting from the stimulation of the normal vestibular apparatus—nystagmus and vertigo. Past pointing is a secondary reaction dependent upon vertigo.

If each time the ear of a normal person is stimulated, these reactions appear in a definite manner depending upon the method of stimulation used, it must be because there are certain pathways from the semi-circular canals to the brain through which the stimulation must pass and the appearance of the reaction cannot be merely a coincidence. No more can we say it is a coincidence if after stimulation, one or both of these reactions fail to appear. The failure of any reaction to appear calls for an explanation by the examiner.

When we see a case with a normal nystagmus but no vertigo and past pointing, or a normal vertigo and past pointing but no nystagmus, we must conclude that there are *separate* pathways for these different reactions. Likewise when we obtain a reaction from the stimulation of the horizontal canal but none from the stimulation of the vertical canals or vice-versa, we must also conclude that there are *separate* pathways for the horizontal and vertical canals.

These separate pathways as worked out by Jones are as follows:

Fibers from the *horizontal* canal enter the 8th nerve as part of the vestibular portion of the nerve and continuing their course in the nerve enter the brain stem at the junction of the medulla and pons and pass to Deiter's nucleus. Here the fibers divide into a Y. One arm of the Y passes through the nucleus triangularis toward the median line to enter the posterior longitudinal bundle. This is the pathway for the nystagmus reaction from the horizontal canal. The other arm of the Y passes to the cerebellum by way of the *inferior peduncle* and terminates in the three cerebellar nuclei-nucleus glabosis, nucleus emboliformis and nucleus fastigii. A few fibers also pass to the dentate nucleus.

From the cerebellar nuclei the fibers reach the cerebrum by two pathways—the chief one being from the nuclei through the superior peduncle to the crura, through the decussation of the crura to the cerebral cortex of the opposite side terminating in the cortical center for vestibular impulses which is situated in the posterior portion of the first and second temporal convolutions. From here a few association fibers connect the center with other parts of the cerebrum particularly the frontal lobe. The second or minor pathway is from the superior peduncle to the crura to the temporal lobe of the same side. This, the vestibulo-cerebellar-cerebral tract, Jones calls the subjective circuit and it is the pathway for the vertigo and past pointing reactions.

(2) The fibers from the *vertical* canals entering the brain stem through the 8th nerve, pass mesad to the fibers of the horizontal canal, ascend through the medulla to the upper part of the pons where they also divide into a Y—one arm of the Y going directly to the posterior longitudinal bundle forming the vestibular-ocular tract for the vertical canals. The other arm of the Y passes through the *middle peduncle* to the cerebellar nuclei mentioned above. From here the fibers have the same pathway as those from the horizontal canal.

With this picture of the separate pathways clear in our mind, we can locate the site of the lesion if after stimulation any of the reactions which normally should be present fail to appear.

It is not within the scope of this paper to describe or explain these reactions. It is taken for granted that we are all familiar with them. However certain points may be mentioned briefly which will aid us in determining beforehand what the normal reaction should be.

In regard to nystagmus the slow or vestibular component of the nystagmus is always in the direction of the endo-lymph flow.

Vertigo—the second primary reaction due to stimulation of the normal labyrinth—is always in a direction opposite to the endo-lymph flow.

Past pointing is a secondary reaction due solely to vertigo, and is in a direction opposite to the vertigo. If there is no vertigo there will be no past pointing.

The most conspicuous symptom we have to deal with in this study of neuro-otology is *vertigo*. To the patient it is the *complaint* for which he seeks relief. Varying in intensity and duration, it at times becomes so distressing as to prevent the patient following out his normal pursuits and our treatment is valued only to the degree to which relief is afforded.

To the physician vertigo is a *symptom* which occurs very frequently and in numerous and various pathological conditions. Under such divers conditions does vertigo appear that little has been done in the way of investigation as to its exact cause and definite methods of diagnosis.

Vertigo is related to a disturbed equilibrium and in order to understand it and arrive at its cause we must first have a clear idea of the different factors which go to maintain equilibrium.

Equilibrium is maintained by a constant flow of impulses to the brain from the eyes, ears, and the muscles, tendons and joints, in other words from our deep muscle sense. Normally this flow of impulses is constant and so balanced or harmonized that we are not conscious of it. It is only when this balance is disturbed, resulting in a confusion and disturbance of equilibrium, that we experience vertigo. Of the sources of these afferent impulses maintaining equilibrium those from the vestibular portion of the inner ear are the most important. A lesion involving the vestibular apparatus anywhere in its course from

the end-organ through its pathways in the brain results in vertigo. As the maintenance of equilibrium is the main function of the vestibular apparatus so is vertigo the most important symptom of its involvement. The application of neuro-otology in diagnosing the cause or the location of the cause of vertigo will have a large field of usefulness for there is no branch of medicine to which the symptom of vertigo is foreign. It comes to the ophthalmologist, the syphilologist, the internist, the surgeon and the neurologist.

The ophthalmologist who appreciates the close relationship which exists between the labyrinth and the eye muscles and who appreciates the fact that by these tests any type or direction of nystagmus can be produced will realize the value of these tests in the diagnosis of whether or not a certain eye muscle palsy is a supranuclear lesion. If for example a patient is unable to look to the left and by rotation we can produce a vestibular pull of the eyes in this direction we realize that the pathway between the labyrinth and the eye muscle nuclei is functionating and the lesion must be supranuclear.

We know that the 8th nerve is the most vulnerable to syphilis of all the cranial nerves. Our diagnosis of involvement of this nerve has been made on the subjective examination of the cochlea portion of the nerve and the value of these functional examinations depended largely upon the intelligence and co-operation of the patient. In the great majority of cases the vestibular as well as the cochlea branch is involved and by these tests our findings are gained without the co-operation of the patient. The information is objective and definite and thus accurate. If we can give information of a beginning cerebro-spinal lues, possibly long before other symptoms develop, it may be that we have a method to aid in the prevention of the later manifestations of syphilis of the central nervous system.

To the internist, vertigo has been shrouded in mystery. It has been met with so frequently and in such a variety of conditions and our knowledge of its cause has been so vague that he has been satisfied to speak of it as gastric, hepatic, kidney or cardiac vertigo and if none of these indefinite terms satisfied the conditions it becomes idiopathic vertigo. In the light of our present knowledge of the anatomy and physiology of the vestibular apparatus, we can no longer be satisfied with the use of such general and often meaningless terms in our explanation of the cause of vertigo. Just as a defective vision must be due to some lesion of the ocular tract between the cornea and the occipital lobes, so vertigo must be due to some lesion of the vestibular tract between the semi-circular canals and the temporal lobe. Just as the primary cause of this defective vision may be due to conditions in some other organ so may vertigo be caused primarily by pathological conditions in other parts of the body having a stimulating, impairing or destroying effect upon the vestibular tract. Just as the eyes are examined in certain diseases because of the appearance of a defective vision, so the vestibular tract should be examined when vertigo appears.

To the surgeon these tests will be an aid in that most difficult part of intracranial surgery—exact intracranial localization. Previously in many cases we have had to be satisfied with a palliative decompression. It is possible that by these tests certain lesions will be so localized that something more than a palliative decompression may be done.

On the other hand we know that lesions located in the medulla, pons or cerebellar peduncle, which are, on account of their location, inoperable, often give rise to symptoms suggesting an operable cerebellar lesion. If we can by these tests, so locate a lesion as to be able to state that it is operable or inoperable, we have given to the surgeon a method of examination which will be of great value to him.

Probably to the neurologist more than to any other, will these tests be of the greatest aid. Due to the close relationship between the inner ear and the central nervous system, he is, in his work, often called upon to differentiate between labyrinthine and intracranial lesions. These tests will give definite and absolute information as to whether a lesion is labyrinthine or not. But the value of these tests is not only limited to the differential diagnosis between labyrinthine and intracranial lesions, for often we are able to aid in or to corroborate a location previously made by the neurologist especially if the lesion is located in the cerebello-pontine angle, the cerebellar peduncles, certain parts of the pons or cerebellum.

In regard to the progress of a lesion involving these pathways the information gained by repeated examination is so definite that its value can not be over estimated and these tests are bound to take their place among the routine methods used by the neurologist.

Thus we see that in this examination of the vestibular apparatus our findings are of value in all realms of medicine. But let me impress upon you the fact that these tests are not to take the place of all other methods of diagnosis nor are all pathological conditions to be diagnosed by these tests. The tests are not intended to diagnose the primary cause of vertigo but only the location in the vestibular apparatus of the lesion causing the vertigo. These tests alone will not tell us whether the vertigo is due to a tumor, gumma or abscess of the cerebellum or whether the vertigo is due to a focal infection from the tonsils or teeth or a toxemia from the intestines or kidneys. They will tell us however whether it is a destruction, impairment, or stimulation of the semi-circular canals, or a lesion of the cerebellar peduncle, or the pons, or some other portion of the tract.

If this work is to be of value in diagnosis it must be done by those competent to do it and the methods of examination must be standardized. If one examiner rotates a patient ten times in twenty seconds and with the head bent forward 30 degrees or douches the ear with water 68 degrees, and another rotates the patient ten times in fifteen seconds or uses water at 66 or 70

degrees their results are not going to agree. Those men who have developed this study have worked out on a large number of cases a certain technic which they have learned from experience to be the best. If in our work we find that our results do not agree with them let us, before we decide that these men are wrong and their work valueless, check up carefully our own knowledge and technic.

In conclusion I wish to report a few of the typical cases which have been examined at the University of California Clinic. The histories are brief; only those points of neuro-otological interest are enumerated.

Case No. 1. A. L. K. Private Patient. First seen in April, 1919. Complains of frequent attacks of dizziness since 1913. Attacks begin gradually and not always associated with change of position of head, although he has noticed that during attacks, dizziness is worse on movements of head, attacks of nausea and external objects appear to move back and forth on horizontal line. Staggering with attacks but to no particular side. Noticed a change in hearing about 1916, more marked in left ear. This is increasing. Tinnitus in both ears since 1913, more in left ear. At first intermittent, but last six months more or less continuous. This patient was a rather close observer, and while he gave me a very full and complete history of his condition, I have only mentioned the more salient points. He has noticed that during his vacations, which he spends out of doors tramping and roughing it, he is free of attacks and usually remains so for a couple of months after his return.

Neuro-otological examination—Hearing: diminished in both, much more in right and with 8th nerve involvement. Rotation to right, horizontal nystagmus to left 16 seconds duration. Past pointing: correct direction but shortened. Falling poor. To left: nystagmus to right 15 seconds duration. Past pointing: correct direction but shortened. Falling poor. Caloric: water 68 degrees. Right ear: Rotary nystagmus to left after 110 seconds. Past pointing: correct but shortened. Left ear: Rotary nystagmus to right after 130 seconds. Past pointing: correct but shortened.

Summary—1. Involvement of cochlea portion on both sides.
2. Impairment of vestibular apparatus, both sides.

Diagnosis—Toxic impairment vestibular apparatus, both sides.
3. X-Ray of teeth showed some 5 or 6 root abscesses.

Case No. 2. Robert M. O. P. D. No. 48248. Referred from nerve clinic. Complaint: Dizziness and pain over right parietal region. On February 10, 1918, operated upon in Omaha for acute mastoiditis. Pain in head still continued. February 25, 1918, pus reappeared in ear and mastoid wound. March 10th attack of dizziness and a great difficulty in walking. Mastoid region curetted. On account of continued dizziness, pain and discharge, wound again curetted on April 22, 1918. At present pain on top of head extending to forehead. Very nervous. Dizziness especially at night or in turning around suddenly.

Neuro-otological examination—Right ear at present dry. Hearing: right ear, complete deafness. Left ear: normal. Rotation to right horizontal nystagmus to left 14 seconds duration. Past pointing: correct direction but shortened. Falling poor. To left: horizontal nystagmus to right, 7 seconds duration. Past pointing: none for right arm (repeated examinations), correct but shortened for left arm. Falling fair. Caloric: water 68 degrees. Right ear: no reaction after 4 minutes (repeated examination). Head back: no reaction. Left ear: Rotary nystagmus to right, after 90 seconds. Past pointing: none for right arm; left arm, correct but shortened. Head back: horizontal nystagmus to right good amplitude. Past pointing: none for right arm.

Summary—1. Destruction right labyrinth.
2. At no time was there any past pointing of right arm to left suggesting lesion of inward pointing center of right arm.

Case No. 3. Robert K. Hospital No. 22717. Seen March 21, 1919. Complains of frequent attacks of dizziness beginning in March, 1918. Attacks becoming more frequent and especially noticeable with a change of position of the body. Staggers and falls to left. No trouble with hearing.

Neuro-otological examination—Hearing: normal, both ears. Spontaneous Phenomena: nystagmus, horizontal to right when looking to right. Marked rotary to left when looking to left. Vertical when looking up or down. Past pointing to left with both arms, more marked with left arm. Falling to left: no change with change of position of head. Rotation: to right horizontal nystagmus to left, 42 seconds duration. Past pointing: correct but shortened for right arm, preverted (to left) for left arm. Falling good. To left marked horizontal nystagmus to right, 35 seconds duration. Past pointing: correct direction but exaggerated for both arms. Falling good. Caloric: water 68 degrees. Right ear marked rotary nystagmus to left in 30 seconds. Past pointing: correct for right arm, none for left arm. Head back: horizontal nystagmus to left. Past pointing: correct for right arm, preverted (to left) for left arm. Left ear: marked horizontal (preverted nystagmus to right) in 35 seconds. Past pointing: correct but exaggerated for both arms. Head back: horizontal nystagmus to right. Past pointing correct but exaggerated for both arms.

Summary—1. Normal hearing.
2. Spontaneous nystagmus shows an irritative or active lesion more marked on left side. Vertical nystagmus pathognomonic of brain stem lesion.
3. Spontaneous past pointing of both arms to the left would suggest an irritative lesion in region of inward pointing center of right arm (it is not a destruction of the outward pointing center of right arm, as patient does past point to right with right arm on douching right ear) and a destruction of the inward pointing center for the left arm. This is further corroborated by the fact that the left arm never past points to the right.
4. Prolonged nystagmus on rotation suggests an irritative condition of the fiber of the horizontal canals more marked on left side.

Diagnosis—Multiple lesions of the cerebellum more marked on left side. Lesions are both destructive and irritative.

Comment—Neurological Diagnosis—Multiple Sclerosis.

The following cases No. 4 and No. 5 are particularly interesting as they give an idea of the possible value of these tests. Both cases were referred from the nerve clinic which thus far has been unable to make a diagnosis as there are at present no neurological localizing symptoms. Neuro-otological examination gave a distinct picture of an intracranial lesion which, by these tests is definitely located. If later our diagnosis is confirmed by the neurologist, then the value of these tests as an aid to the neurologist in the location of certain lesions is beyond question.

Case No. 4. Harry S. O. P. D. No. 51616. Age 49. Referred from nerve clinic, April 2, 1919. Complains of dizziness since October, 1918, following attack of Influenza. Attacks becoming more frequent and severe and come on with change of position of head. Staggers at times forward and to the right. Has never fallen. No deafness. Tinnitus intermittent and more in right ear.

Neuro-otological examination—Hearing: good in both ears. Rotation to right: horizontal nystagmus to left, 25 seconds duration. Past pointing: normal. Falling: normal. To left: horizontal nystagmus to right, 30 seconds duration. Past pointing: normal. Falling: normal. Caloric: water 68 degrees. Right ear: faint rotary nystagmus to the left after 80 seconds. Past pointing: correct direction but shortened for both arms. Falling: normal. Head back: 60 degrees horizontal nystagmus to left and past pointing correct for both arms. Left ear: no nystagmus after 4 or 5 minutes douching (2 examinations). Past pointing: correct direction for both arms. Vertigo: normal. Falling: normal. Head back: 60 degrees marked horizontal nystagmus to right, past pointing correct for both arms. Head up and nystagmus disappears.

Summary—1. All reactions go through except nystagmus reaction from left vertical.
2. Right vertical canals pathway slightly impaired shown by prolonged time to produce reaction and shortened past pointing.

Conclusion—Lesion in upper half of pons on left side between the division of the fibers of the left vertical canals and the posterior longitudinal bundle. The slight impairment of the right verticals may be explained by pressure of the lesion on the right pons.

Comment—No diagnosis has yet been made by the neurologist due to the absence of definite localizing neurological symptoms.

Case No. 5. Bosilios S. O. P. D. Referred from nerve clinic. Complains of dizziness since March, 1919. Comes on suddenly and is increasing in severity. Attacks come with change of position of head. Staggers to right. Has fallen to right. Says he has no trouble with hearing and no tinnitus.

Neuro-otological examination—Hearing: complete deafness in right ear (duration unknown). Left ear: normal. Romberg to right, which does not change with position of head. Rotation to right: horizontal nystagmus to left, 15 seconds duration. Past pointing: both arms correct direction. Falling: good. To left: horizontal nystagmus to right, 7 seconds duration. Past pointing: both arms correct. Falling: good. Caloric: water 68 degrees. Right ear: no nystagmus after 4 minutes (two examinations). No past pointing. Head back: no nystagmus or past pointing. Left ear: rotary nystagmus to right, poor amplitude so that difficult to note, after 110 seconds. Past pointing: none for either arm. Head back: marked horizontal nystagmus to right. Past pointing: correct, both arms. Douching left ear with head back 60 degrees and water 68 degrees: marked horizontal nystagmus to right in 27 seconds. Past pointing: correct, both arms. Head up and no nystagmus or past pointing.

Summary—1. Complete destruction of vestibular and cochlea portion of right side.
2. Marked impairment (almost destruction) of fibers from left verticals.
3. Pictures of right cerebello pontine angle lesion of recent origin (not large enough to completely destroy fibers of right verticals as yet).

Comment—No diagnosis as yet by the nerve clinic due to lack of definite localizing symptoms.

135 Stockton St.

COMPARISON OF THE ACTION OF ROENTGEN RAYS AND RADIUM.*

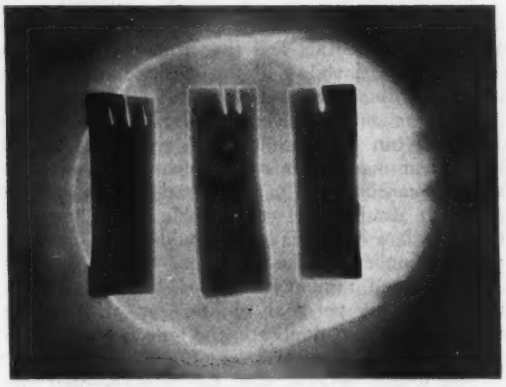
By ALBERT SOILAND, M. D., Los Angeles.

In a former paper, the writer described the source and distribution of both radium and X-Rays,[1] and at this time would like to call attention to a comparison of the actinicity of radium and Roentgen rays.

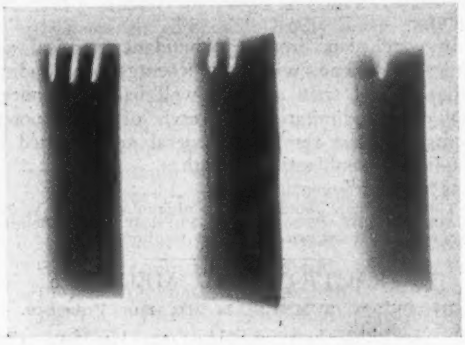
In going over the literature devoted to the physics and therapeutics of radium, one is struck by a confusion of statements as to the penetration and distance traversed by the various radium rays. Also the terms, alpha, beta, and gamma rays, emanation, particles, and waves which are so frequently interchanged that it is difficult even for one familiar with radio physics to intelligently follow the discourse. These terms are often used indiscriminately to designate each and all of the different forms of energy derived from radium.

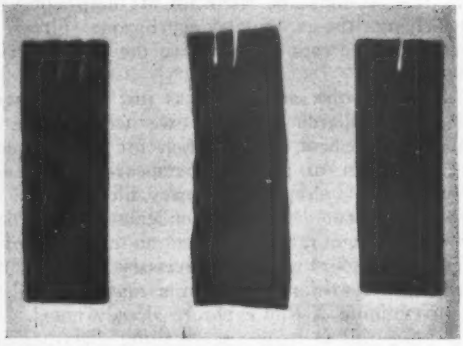
For the purpose of elucidating the following photographic experiments with radium and Roentgen rays, a few fundamental facts will be reiterated. Radium element in process of decay gives off emanation, an inert gas called niton, and alpha particles, the latter being atoms of positive polarity. The emanation is unstable and loses more alpha particles, after which it is known as radium A. Radium A gives off alpha particles, then resolves itself into radium B, changing in turn to radium C, D, E, and F. The radio active period with which we have mostly to deal is the transition of radium C, for this compound gives off in quantity, alpha, and also the beta and gamma rays, with which we are concerned therapeutically. The alpha rays or particles are not considered seriously in therapeutics. They are of exceedingly limited range of activity and are easily arrested by any filter. If allowed to strike the unprotected skin in quantity, they give rise to a very disagreeable but quite superficial dermatitis. The beta particles are of negative polarity, similar to the Roentgen cathode stream, and in their transmutation give rise to true beta ethereal waves, which the writer believes to be the real therapeutic factors in radium. The gamma radiation is a purely ethereal one of higher penetration and exceedingly short wave length, closely related to the Roentgen ray. The primary beta rays or negative electrons from radium are corpuscular streams, which upon meeting an obstruction are capable of transforming their energy into secondary beta rays, and it is these waves or disturbances that produce the well-known metabolic changes in living protoplasm. The gamma rays are not corpuscular, but at their point of arrest give off secondary rays similar to the beta, and as already stated are of shorter wave length, of relatively higher frequency, and greater penetration. The beta corpuscular stream or primary beta rays

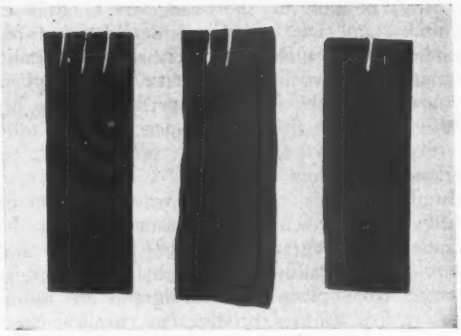
* Read before the Forty-eighth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1919.



4. X-Ray exposure on same lead plates, 5 milliamperes of current, 100 kilovolts, 8 inch skin distance, time 5 minutes. Note intensive action on lead plates, particularly the one and two millimeter thickness.







5. Radium 100 milligrams, 8 inch distance from covered negative. Exposure one hour. Note radio activity in lead plates to an equal degree, also secondary beta rays with negative polarity, which are plainly demonstrated from each south pole of the lead.

6. X-Ray exposure, 6 inch back up, 100 kilovolts, 50 milliamperes, 8 inch distance from covered negative. (a) Exposure one second. (b) Same set up and technic, exposure ten seconds. Note intensive actinic and chemical action on lead in direct proportion to thickness of same.

and to a lesser degree the gamma rays from radium have the power of imparting radio activity to practically all substances. This induced radio activity is best exemplified in the denser metals, those of highest atomic weight, showing this process in the most intense form. This induced radio activity is of very transient nature, the objects affected readily yielding up their energy in heat. In an energized X-Ray tube, the cathode corpuscular stream is all transformed within the tube itself; hence, we get no secondary beta X-Rays. We do get, however, from such an X-Ray tube an enormous amount of ethereal wave disturbances, which when arrested or reach their point of absorption give off precisely the identical wave form of energy that is exhibited by all the active principles of radium.

To make a comparative rating between a single massive Roentgen exposure and a single one with radium would involve many factors and render such a task exceedingly difficult. In a functionating X-Ray tube, we have a potential source of radio activity, greater perhaps than in all the world's available radium, at least greater than all the radium in the United States. To establish a standard technic under such conditions, one would be compelled to reduce the X-Ray output in an individual unit to a degree that would correspond to a standard radium equivalent. The next step would be to use suitable filters to insure wave radiation of the same length and frequency for both agents. Then if the time element of exposure could be harmonized, it would make absolutely no difference which agent be employed. In such an exposure with either agent, the tissue changes would be exactly alike, both clinically and microscopically.

At present, a standardization as just outlined is impossible, and we will have to confine ourselves to discuss radium in the amounts usually available for practical work. Outside of a half dozen large Eastern institutions, this would range from 100 to 200 milligrams element.

In Roentgen therapeutics, the ordinary set up of a Coolidge tube, working on 100 K. V. pressure, with 5 M. A., at an 8-inch skin distance without filter, will produce an intensive erythema or surface reaction sufficient to destroy a superficial epithelioma in one five-minute application. As even this short exposure has been found to produce lasting X-Ray dermatitis in susceptible individuals, such an application is undesirable in skin work, so

this dose is normally used for its deep effect on underlying tissues employing opaque filters to screen out the rays that produce the surface irritation.

To obtain the same action as just outlined with say 100 milligrams radium, we would have to apply this element or emanation for several hours over the skin to get the therapeutic effect, and if we desire a deep effect, heavy filters would be necessary to cut out the preponderant radium beta or short range rays, and then an exposure of a great many hours would be necessary to permit the gamma rays to functionate in a manner equal to the five-minute X-Ray exposure already noted.

Bearing this in mind and recalling that radium's greatest source of energy lies in its preponderance of beta radiation or short-range rays, it is easy to understand why a radium dermatitis is more evanescent than a Roentgen dermatitis. A radium dermatitis is just like an intense solar erythema. It appears quickly, is quite superficial, hence heals readily. Exactly the same sequence would follow an exposure by a so-called soft X-Ray tube working under low K. V.

In this example, the X-Ray wave radiation produced would resemble the usual radium beta radiation. Photographically, the foregoing statements can be readily demonstrated. At a 48-inch distance from plate, 150 milligrams of radium, exposure five minutes, produces no chemical change in the emulsion. This demonstrates that no beta rays reach the plate, and that the gamma rays pass through the emulsion unchanged. Placing strips of lead on plate and repeating experiment, but increasing time to ten minutes, shows a slight fogging of the emulsion due to the induced radio activity in the lead strips. The same experiment carried to one-half hours exposure with a fresh plate shows the shadows more clearly.

Performing the same experiment with an X-Ray exposure at the same distance, the emulsion of the plate is blackened with the shortest exposure we can make, viz. 1/60 of a second. With radium (200 mg.) distance ten feet, no image was obtained by either primary or secondary rays in one hour's exposure.

In order to ascertain the distance at which a serviceable X-Ray plate could be made with an ordinary exposure, we rigged up a tube and plate to get the greatest space possible in our laboratory. This measured forty feet from anode to negative. An exposure of ten seconds, fifty milliampere, on a six-inch back up, gave us a serviceable plate, that is where bone detail can readily be seen, attention being directed to the fact that the total X-Ray energy used was quite ordinary in amount. The photographic experiments were made under working conditions as nearly alike as possible. Thus the average amount of radium used at an ordinary treatment rarely exceeds 100 milligrams element, and for all the plates made at working distance, this amount is used. In the long range exposures, 150 and 200 milligrams element are employed. The X-Ray plates were made with the regular standard Coolidge tube settings.

Photographically, it is almost impossible to demonstrate the difference between the dermatitis produced by X-Rays and that from radium. This is due to the inability of the sensitive emulsion to register ordinary color changes.

Every competent Roentgenologist and radium therapist can show slides and give case records of a great many lesions cured; therefore, no time will be consumed in an elaboration of this kind now. It would be of considerable value, however, to know how many failures would ensue out of a certain number of like conditions treated by both Roentgen and radium therapy. The test then becomes one of personal ability, for with ample radium one can duplicate the effects of Roentgenization and vice versa.

The writer believes that the X-Rays offer decided advantages in the treatment of lesions covered by, or affecting, the epithelium. On mucous membranes or in cavities where soft tissues predominate, radium becomes the element of choice. This is particularly true in lesions involving the mouth and upper respiratory tract, the vagina, uterus, and rectum.

In conclusion, from an abundant practical and clinical experience with both Roentgen and radium radiation and with a fairly well balanced conception of the limitations of each of these potent agents, the best results in general are obtained by a judicious combination of both.

527 West Seventh Street.

1 The American Journal of Roentgenology, Vol. V, No. 8, August, 1918—"The Electro-Physical and Chemical Properties of Roentgen Rays and Radium."

REFRACTION AND MEDICINE.

By PERCY SUMNER, M. D., San Francisco.

So much has been published the last few years on focal infections that most physicians are fully alive to the dangers caused by these and usually institute a careful search for the offending member, when there is any obscurity as to the cause of the trouble of which the patient complains. Of course any movement of this sort is apt to be overdone and frequently one finds a patient minus teeth and tonsils and possibly other things that may still complain of indefinite and indeterminate discomforts.

It is for this class of patients that I am now taking the liberty of asking you as physicians if you have determined the condition of their eyes; have they errors of refraction that have either not been corrected at all or if treated then only superficially by an optician, or an oculist who does not appreciate the growing importance of thorough refraction in this age where the stress of life bears particularly hard on the nervous system? And I may here state that there is no greater drag on the nervous system or a spendthrift of nervous energy than the ciliary muscles in their attempt to give clear and sharp vision in the presence of even a small degree of refractive error.

Most of the people who have been subjected to the focal infection search often have an underlying unstable nervous balance, and when every-

thing has been done and they are assured they will be well, it often turns out that they are disappointed in their expectations and the loss of faith in their purposed cure tends to depress them more than ever and they become quite discontented and unhappy, and are apt to wander from one physician to another in a vain search for a cure.

About half of the patients sitting around the internal medicine man's office are the victims of eye strain, whether they are wearing glasses or not; and the first important thing to do for them is to send them somewhere where a thorough and careful examination can be made of their eyes to the end that the internist may feel confident that the eye strain is not one of the contributing causes of their complaints.

Just why physicians will send patients to opticians for eye examinations (as some do) or why people will be satisfied with the most cursory sort of a refractive examination at the hands of a very busy oculist is beyond my comprehension, unless it be due to ignorance in both cases. It is true that a number of people are deceived and imagine they are in competent hands when they land in the office of a man who is a "doctor," even though it be only doctor of optometry; and probably they feel that since he cannot help them there is no use in searching further and consequently must bear their discomforts with whatever philosophy they can muster.

The attitude of the physician to the oculist can also be easily explained. In the earlier days of ophthalmology the oculist gave his patients a most cursory examination for glasses and then proceeded to treat the patient indefinitely with the "drops" method. Probably that is the reason why the opticians have flourished and prospered, and why to-day you can find an optical store in every block and in almost every drug store and cheap jewelry house.

To be a refractionist in the best sense of the word calls for qualifications and training that are equal at least to any other medical specialty. In the first place he must be thoroughly grounded in the fundamentals of general medicine; he must have considerable knowledge of the mental make-up of human beings; and he must further have sufficient knowledge of the many things that contribute to eye discomfort—nose, throat, teeth, etc.; and, finally, he must be thoroughly competent and interested enough in refraction to conduct a most careful and thorough examination of every patient who consults him. And such an examination consumes considerable time. The method I pursue is as follows:

When the patient first presents himself I examine the eyes to determine if there is any refractive error; look at the disc and determine the tension; find the visual acuity and if the patient is wearing glasses determine the correction. At the same time I get an impression of the general make-up of the patient, and frequently on this ask questions of history that will give a clear understanding of the cause of the patient's complaints. Then I make an appointment and instil homatropin in each eye at ten minutes' interval until seven drops have been used in each eye, so that I may make a careful retinoscopic and subjective test. (And here I may state that homatropin does not paralyze the muscle completely in every case; often the muscles will react to stimulus after the most careful preparation. And if there is any question at all of the results of such an examination, then atropin should be used for two days. But it is a difficult matter to persuade a patient to have atropin put in the eye, and one must often be content with homatropin, which, when properly used, gives satisfactory results in most cases.)

After four days, when the muscles have regained their tone, I again try the correction, measure the muscles, determine the amount of accommodation, and finally the prescription. I measure the pupillary distance, determine the best sort of mounting and set down all the particulars on paper so that when the optician sees it all he has to do is to go by my directions. When the glasses are made the patient brings them directly to me and I determine by measurement that the correction is as ordered; that the glasses set properly on the nose and that the pupillary distance is right. After a few days the patient returns to see if the adjustment is all right and incidentally to be encouraged in the proper use of the glasses. At the end of three or four weeks when I feel the patient has become accustomed to the glasses and the ciliary muscles are relaxed, I again go over the manifest correction and make further note on the behavior of the muscles, and if any improvement can be made at this time I have the lenses changed.

And in regard to mountings one must know the optical business to understand the importance of the proper mounting. This must not be left to choice. It is practically impossible to put spectacles on a woman, and often, too, on men; and though I was trained in the belief that these are the very best things to wear, yet the modern eyeglass mounting can be made to hold the lenses in good position and it is better in my opinion to wear eyeglasses constantly than to be carrying a pair of spectacles in the case. Every little detail of the glasses must be scrutinized; because my contention is that as glasses are a part of modern equipment as much thought should be given to both the practical and aesthetic sides of glasses as is given to one's dress. One may have quite stylish mountings without going to the extreme of wearing the heavy library frame, which is impractical, as the lens slip around in the frame.

I would have hesitated to describe this method in detail, because it seems so unnecessary to many who are accustomed to the old way, had it not been for a paper written by an eminent internist, which he read before the Eye Section at the American Medical Association at Atlantic City, where he made an appeal to oculists to give careful and thorough refraction to patients and at the same time to become interested in them from the neurological point of view. His statement that

there are a great many patients of a neuropathic disposition that can be helped greatly by the co-operation of the internist and the oculist I fully agree to; and his request that oculists should not treat the eyes as if they were optical instruments is perfectly reasonable and humane. But my impression was that the shoe pinched the other foot —that the physician ignores almost entirely the fact that "body and mind are closely bound together and exert a constant interaction on each other"; and usually they are satisfied to let it go at that when they find the machinery seems to be in order. They let the patient go with the statement that they are "only nervous" and that there is "no organic trouble." What is the use of dismissing a patient, often very intelligent, with such a bromidic statement as this? What is the use of having perfect machinery if the supply of energy does not run smoothly or is insufficient to keep the machine going evenly? Or if the mind and emotions occasionally do an act of sabotage and drop something into the complicated cogwheel arrangement that keeps this machine working? Let me quote from L. Frank on this subject:

"A correct understanding of human biology leads inevitably to the conclusion that man can live a healthy and happy life only when he is not fighting like a Don Quixote against the forces working in him, the gregarious instinct and the longing to love and be loved. The university courses in medicine, theology, law and pedagogy, although the professions they teach have to deal always with man and his relations with his environment, yet pass over entirely the normal or pathologic life of sentiment and sex relations in general. Are not these psychic processes the axis on which our entire human life revolves, its happiness and its unhappiness? Are these forces actually imponderables for the physician?"

It is my impression that whether a physician is interested or not in something more than the mere machinery depends not on his specialty so much as on his individuality; and I am sure that there are a great many physicians who would welcome with pleasure anything that would guide and help them to understand the psychic side of medicine. But unfortunately a neurotic is like a poet, born, not made, and one has to be something of a neurotic to understand it in others. But there are three small books on the subject that may help to guide your sympathy and understanding: White, The Mental Hygiene of Childhood; White, Principles of Mental Hygiene; Wells, Mental Adjustments. And in reading about the neurotics and in dealing with them please remember these words of Goethe: "An intelligent man finds almost everything ridiculous, a wise man hardly anything."

So many of my patients who have come to me on the recommendation of other patients have told me of their medical travels and that the advice to have their eyes carefully measured did not come from a medical man at all, but from a layman. A great many physicians seem to think that if a patient has sharp vision and makes no direct complaint about the eyes that they must be all right; but sharp vision is often obtained at so tremendous an outlay of nervous energy that this class of patients cannot really afford to expend it.

Perhaps here it would be well to explain the oculist's standpoint. It is our ideal to fit the eyes so that the patient can see in the distance with as little play as possible on the ciliary muscles. The emmetropic eye looking off into distance is absolutely at rest, the rays of light from objects being focussed on to the retina by the refractive media of the eye, without the use of the ciliary muscle. So with the muscles paralyzed by a cycloplegic one can determine the amount the muscles have been accommodating to get good distance vision —the static refraction. This is the scientific side of the refraction, the art of it comes in to determine how much or how little can be allowed the muscles to work in the distance, for it is quite evident that a muscle that has been doing a great deal of work in the distance does not give out suddenly when glasses are put on, and there is often blurred vision in the distance till they do relax. What allowance to make for the muscles depends to a great extent on the physique of the patient, the class of work he does, etc. That is where there is a wide gulf separating opticians and ophthalmologists—the former fit them with glasses to make them see well; we fit them to make them well.

That refraction is neglected in clinics is due to the amount of time it consumes and the trying part of it, when one has much of it to do; and if it is done mechanically it becomes a frightful bore. And there is nothing spectacular about it to attract attention. It is for these reasons, possibly, that two of the large eye-clinics in San Francisco have opticians doing the refraction for them.

Of course a great deal of this indifference to refraction on the part of the medical profession is partly due to the economic side. If the average person were educated up to the point where he would pay as much for a complicated refraction as he will for a simple operation, then there would be some reason for doing refractions. But what is the use of spending two, three, or even four hours on a refraction, when any sort of an operation performed in much less time pays bounteously? And a man devoting himself to refraction can see only a few patients a day, and the work itself tends to specialize one's abilities in that direction alone.

Oliver Wendell Holmes said that to train a child one must begin with its grandparents and in regard to the wearing of glasses it is certainly true that one must begin with the parents. Time and again it has been necessary to caution parents about speaking against the wearing of glasses when they bring their children to me with the statement that the child cannot see well or suffers from headaches, and most of them in the same breath express the wish before the child that they do not want it to wear glasses, they

look so ugly, etc. The child readily absorbs this statement, as is usual with all bad counsel, and when it grows up passes it along to its children. So that right at the start there is a prejudice bred that has to be combated for all times.

To my mind the wearing of glasses under the present conditions of life has become an imperative necessity to the majority of people. From the hour of waking to the moment of retiring the ciliary muscles are in constant use—a use that never was intended by nature. The amount of work done by the civilized man of to-day with his eyes is stupendous. There are constant and increasing demands for the eyes particularly; in addition to work, the moving pictures, interesting books, automobile riding, with its constantly shifting views, pulling always on the eye muscles, give very little opportunity for relaxation of the eyes. Modern man is constantly doing something, and that something involves always extra work on the nervous and muscular systems through the work done by the ciliary muscles.

The war has familiarized one with the term of shell shock—a group term for a great many cases of neurasthenics and neurotics. But to the appreciative mind it was not necessary to have a war to show that society is filled with shell-shocked people. Life with its nervous stress did that for them long before the war was thought of. And if people are to be helped then their energy must be conserved before the break becomes apparent to the least observing person.

It has been a favorite saying when a man has strong and powerful vision that he has the eyes of a savage. But this, like a great many other sayings, is not true. Some physician of an inquiring turn of mind examined the eyes of a tribe of Indians and he reported that they had practically the errors of refraction that we find in the eyes of civilized persons who are using them constantly. The only difference being that the one rarely uses his accommodation, and the other practically never ceases to use it.

The question then why the eyes give out in some in early childhood, in others in adolescence, and yet in others not till about the fortieth year is due to the inherent vitality of the individual and the sort of use the eyes are subjected to. Many neurotics' first indication of exhaustion is manifested in the eyes by pain and discomfort; and when they rest and their general physical tone is raised then the discomfort passes away, to return again on the least sign of exhaustion. One of the constant signs of neuroses is a persistent subnormal accommodation, after the eyes have been used even moderately.

In anemias, neuroses, neurasthenia and many of the debilitating diseases the constant complaint about discomfort after reading and using the eyes is due to the fact that the organism has not sufficient energy stored up to supply the demands made on it and the eyes are often the first warning of this lack of vitality. Frequently after paralyzing the muscles with homatropin the patient notes the next day how much better he is in regard to his eyes and general condition; and frequently people who are confined to deskwork when they go off on a long vacation find they can discard their glasses and work without any discomfort for a varying period until the exhaustion again creeps over the nervous and muscular systems and they have to go back to their glasses.

Often the parents note the beginning of their children's eye troubles following an attack of measles, attributing the cause from some poison of the disease; but, as a matter of fact, the trouble is usually a refractive error and the debilitating effect of the disease lowers the general vitality and consequently the child cannot afford to expend what it formerly did on getting vision.

It is surprising how often people who complain of stomach and bowel troubles—"dyspepsia," they call it—can be helped by the wearing of properly fitted glasses. And the explanation is the same—the much needed nervous force for the proper functioning of the digestive apparatus is directed into its proper channel and not wasted trying to get good vision. I remember the case of a young woman who came to me about her eyes. Her history was that she had had headaches for some time; but for the past few weeks had been nauseated, had no appetite, and was losing weight in consequence. The examination of her eyes showed only a small amount of hyperopia with slight astigmatism, which, however, was against the rule. I was dubious whether the error could cause so much trouble; yet she reported back to me within a month with the statement that all her disagreeable symptoms had disappeared and that she had regained all of her lost weight. That taught me a lesson, and since then I have been extremely careful to look for even the smallest amount of astigmatism and to incorporate it in the prescription when prescribing the lenses.

We may say then that the tremendous demands of civilization on the eyes make it absolutely necessary to conserve as much as possible the nerve forces of our patients; that it would seem folly to wait until definite attention is called by the patient himself to his eyes; but if for any reason any person presents himself to a physician with any suggestion at all of disturbed nervous equilibrium, then the eyes should be carefully examined and glasses prescribed; and the diversion of the energy, previously wasted, into its proper channels is frequently sufficient to turn the scale in the patient's favor. There are two things that patients of this sort need—a philosophy of life and more energy.

And in conclusion I would state that the old joke on Bostonians "that it is perfectly shocking to go around with naked eyes" will some day come pretty nearly working out to be a truism.

135 Stockton St.

GOITER.*

By A. B. COOKE, M. D., Los Angeles, Senior Attending Surgeon Los Angeles County Hospital.

Certain facts connected with the goiter problem are so elementary and obvious that they are apt to receive less consideration than their importance demands. Greater interest attaches to the new and speculative; and oftentimes a theory with little more than novelty to commend it will flourish for a time at the expense of well established truths.

The purpose of this brief paper is to summarize a few fundamental propositions upon which any comprehensive grasp of the goiter problem must be based.

The first essential in studying the pathology of an organ is to understand as nearly as may be its physiology. With reference to the thyroid gland this condition is easier named than realized. In the nature of things we cannot hope that the final word will soon be said about the function of any of the ductless glands. But we know enough about the thyroid at least to serve our present needs.

It is generally accepted that the thyroid secretion is the great regulator of metabolism. The maintenance of body heat, the process of growth, the expenditure of muscle energy are all dependent in some important sense upon this secretion. At certain times it is perfectly normal and logical that a large increase in the output of the gland should be required, notably at puberty and adolescence, during pregnancy, and as the result of long sustained mental worry or excitement of any kind. Indeed the enlargement of the gland so familiar in young girls at 12 to 18 or 20 years of age may be properly spoken of as physiological goiter. And so, also, when the condition is encountered during pregnancy and following long periods of anxiety, such as marital trouble or the illness and death of a loved one, we may reasonably conclude that in response to excessive demand the physiologic has become the pathologic. The result of such over-functioning is temporary in the great majority of instances, else goiter would probably be the most common of all diseases.

The correctness of the foregoing conception of thyroid function is strongly supported by the phenomena which attend decrease of the glands secretion by reason of disease process or as the result of over-zealous surgery. The cretin is a pitiful example of congenital deficiency. In myxedema the temperature remains persistently subnormal and every metabolic activity is expressed on a constantly descending scale.

I would not argue that the physiologic explanation just advanced applies to every case. It is to be understood of course that the thyroid gland, like every other organ of the body, is subject to various disease processes, e. g., infection, syphilis, malignancy. But it is clear to me that perverted physiology offers the readiest explanation of most of the cases which are encountered clinically.

*Read before the Southern California Medical Association, Riverside, May 1919.

It is commonly agreed that about ninety per cent. of goiter cases are met with in women. No other explanation of this striking fact can be offered than that the complex physiological functions of woman and her more unstable emotional nature furnish the conditions which render her more vulnerable. In this connection I may mention in passing a rather curious bit of personal experience, that of my last twenty-five consecutive goiter operations, nine, or thirty-six per cent., were performed on men. Three of the nine were cases of true Graves' Disease. I can only account for this interesting experience on the theory that in the rigid physical examinations required in the recent drafts for army service, many instances of enlarged thyroid previously wholly unknown to their possessors were discovered. It is a matter of daily observation that the average man is quick to seek relief when he learns that any of his bodily organs are not as they should be.

CLASSIFICATION.

Outside of the largest clinics where abundance of material and perfect laboratory facilities are available it is practically impossible to conduct those technical investigations upon which the finer pathologic distinctions perforce depend. But it is always possible by studying each individual case carefully, by learning to interpret symptoms in the light of clinical findings, by correlating the facts of treatment and operation with the theories of etiology and pathology, to establish a safe working basis for the handling of these cases.

Aside from intellectual entertainment I am not just sure that any real virtue attaches to the scheme of divisions and subdivisions which has been so persistently exploited in the recent literature of the subject. The tendency is rather toward general confusion. Certainly the patient's interests are not materially advanced by prolonged efforts, however painstaking, to determine whether his case falls under the "typical toxic" class or the "atypical toxic" class. The matter of vital concern is, not refinement of classification, but quick and accurate determination of the indications for treatment.

Every goiter is either toxic or non-toxic. Recognizing that any given case may at different times fall under both these heads, it is still proper to say that all cases are included in these two broad classes.

SIMPLE GOITER.

Simple or non-toxic goiter comprises far the larger class. Under this head falls that very numerous group which I have heretofore designated as physiologic goiter. In addition it embraces the variety so prevalent in certain communities which is supposed to have its origin in drinking water. The great majority of colloid and cystic goiters also belong to this class. Whatever the etiology or the pathologic characteristics of the cases of this group, the important thing to remember about them is that they do not give rise to toxic symptoms. When such patients seek medical advice the object is to obtain relief from

cosmetic deformity, or because of pressure, weight or other mechanical difficulty.

Surgery is rarely demanded in the treatment of simple goiter. This is one of the few diseases for which it may be said that specific medical treatment is known. Iodin is the sovereign remedy. If due care is exercised in the selection of the preparation, extract of the gland is perhaps the best form in which to administer it, though good results are obtained from the iodides with or without topical applications of the tincture. Thyroxin, the active principle of the thyroid isolated by Kendall of the Mayo Clinic, is not yet available; but, if it fulfills its promise, should prove the most valuable of all remedial agents.

When surgery is called for in the treatment of simple goiter it usually entails no particular hazard and the results are eminently satisfactory to all concerned.

TOXIC GOITER.

Of the several designations applied to this type of goiter hyperthyroidism is undoubtedly the best because it conveys a definite idea of the disease process. The term exophthalmic goiter is objectionable because it emphasizes a single symptom and one which, though characteristic enough when present, occurs in only about thirty per cent. of cases and then only as a late manifestation, long after correct diagnosis has been or should have been made from other symptoms. The designation, "Graves' Disease" merely does honor to an early writer on the subject, but will doubtless live always in the literature.

The general term toxic goiter seems to me far preferable to any other because of its comprehensiveness. Attempts to classify into separate groups and subdivisions only lead to confusion. Does the goiter give rise to dangerous symptoms? Then it is a toxic goiter. That is the important point for the clinician to determine.

The symptomatology of toxic goiter is by no means uniform and constant. There may be no visible enlargement of the thyroid gland:—this is the one distinctive feature of simple goiter. There may be—in the majority of cases there *is*—no protusion of the eyes. But there *must be* a persistent tachycardia for the diagnosis of toxic goiter to be justified. Let us be perfectly clear on this point. A persistent tachycardia does not necessarily mean toxic goiter; but a toxic goiter is invariably marked by a persistent tachycardia. In my judgment a persistent tachycardia alone, when it cannot be otherwise satisfactorily accounted for, justifies at least a tentative diagnosis of toxic goiter.

Confirmation of the diagnosis depends upon the so-called minor symptoms. Of these tremor and muscular weakness with gradual loss of weight are the most constant and reliable. In my experience the tremor is a very constant symptom even in mild and early cases. Muscular weakness occurs later and is usually attended by loss of weight in spite of an exaggerated appetite and increased intake of food. Mental irritability, degenerative changes in the heart muscle, the several eye symptoms, etc., are to be regarded merely as useful, but not essential, corroborative evidence in reaching a conclusion.

Summing up the question of diagnosis I think we are warranted in saying that, given a case in which there is an enlargement of any degree in the size of the thyroid gland and in which there is a persistent tachycardia, the diagnosis of toxic goiter is reasonably certain. If in addition tremor is present I personally feel that there remain no grounds for doubt.

The indications for the treatment of toxic goiter are as definite and unmistakable as for the treatment of simple goiter. Let me say at once that I am fully persuaded the indications in the great majority of cases are best met by surgery. To be sure, temporary benefit may be obtained from rest in bed, sedative remedies, the application of the Roentgen-rays and other therapeutic measures. But in the light of our modern knowledge surgery offers the only dependable means of positive and permanent cure.

At the risk of seeming gratuitously presumptuous I venture here to sound a note of warning. There is no place for iodine or iodine bearing compounds in the treatment of toxic goiter. A sovereign remedy in the treatment of simple goiter, it holds only mischievous, not to say disastrous, possibilities when administered to the hyperthyroid patient. This point cannot be too strongly emphasized. There can be no doubt but that many a confiding patient has been speeded toward the "great adventure" by failure of his physician to recognize the distinct therapeutic indications in the treatment of the two classes of cases.

There is no more satisfactory field in surgery than that of toxic goiter. The results are uniformly gratifying; they are often decidedly brilliant. In the advanced stages the dangers, of course, are great. But the newer methods of handling such cases both before operation and in the operation itself have done much to lessen the risk involved. And happily, this desperate type of cases is becoming more and more rare as the public becomes better informed on the subject.

I am keenly sensible that there is little to justify the presentation of a paper like this before this body. Let the purpose which inspired it also excuse it. That purpose was to call attention to certain simple but vitally significant truths about goiter, lest in our interest in the novel and theoretical we lose sight of fundamental principles.

Hollingsworth Bldg.

CANCER OF THE EAR, NOSE AND THROAT.

As Well as Tuberculosis, Lupus and Various Minor Affections Treated by the High Frequency Current; With Report of One Case of Carcinoma of the Superior Maxillary.

Illustrations Used in This Paper Are From Dr. W. L. Clark's Publication.

CULLEN F. WELTY, M. D., San Francisco

When a procedure is recommended for the treatment and cure of cancer, tuberculosis or lupus, it at once attracts our attention because all the surgical procedures heretofore have been so unsatisfactory.

During the past year I have seen some twelve cases of cancer of the tongue, tonsil or of the nose, besides four cases of cancer of the larynx. Some of the cases have been operated, some have refused operation. However, the whole lot of them are now dead.

Fig. 1. A—Advanced squamous cell carcinoma of the tongue of four months' duration in a man, aged 46, referred by Drs. John B. Deaver and Walter Ziegler of Philadelphia. The cervical glands were involved and treated by the roentgen ray. The tongue was amputated at the line of the tonsils by the electrothermic coagulation method under general anesthesia, without hemorrhage. Little pain or discomfort followed the operation. B—Result after electrothermic treatment. No local recurrence in two months. This photograph is shown to demonstrate the practicability of amputation of the tongue by the electrothermic method. C—Tongue in another case immediately after amputation by this method. Note coagulated area at distal end.

Fig. 2. A—Rodent ulcer involving bone of maxilla and mandible, of three years' duration, in a man, aged 50, referred by Dr. William H. Schmidt of Philadelphia. One electrothermic coagulation treatment was given under ether anesthesia in April, 1915. B—Result. No local recurrence in eight months, when patient died with what was diagnosed as abscess of the brain by the attending physician, but which may have been metastasis.

I wish to say that this high mortality is probably at variance with mortality tables covering a greater number of cases. It is a known fact that occasionally a case will get well, but I should say the mortality must be near 80 or 90% for those that live for one year or more.

It naturally follows that any procedure that offers anything better than this would be accepted very readily.

A publication by Dr. W. L. Clark appeared in the Journal of the American Medical Association, of October 26th, 1918, entitled "Cancer of the Oral Cavity, Jaws and Throat; Treatment by Electrothermic Methods or in Combination with Surgery, the Roentgen Ray, and Radium; With an Analysis of Two Hundred Cases So Treated." At once I wrote for particular instructions regarding the use of this high-frequency current. Correspondence was unsatisfactory and I made a trip to Philadelphia to see the work for myself.

Fig. 3. A—Epithelioma of tongue of six months' duration in a man, aged 74, referred by Dr. J. C. Biddle of Fountain Springs, Pa. B—Result of dessication treatment under local anesthesia in May, 1911. There were enlarged glands on both sides of the neck in this case, which were probably inflammatory, since they disappeared after the treatment of the tongue lesion and the application of the roentgen ray to the neck. There was no recurrence in four and one-half years, when the patient died of some other disease.

To quote Dr. Clark, rationale of the dessication method is as follows:—

"The effect of heat when applied to the living tissue varies according to its intensity, from simple hyperemia to carbonization. Somewhere between these antithetic points, there is a thermic degree, the effect of which is more than hyperemia, but not the extreme effect of carbonization. I have called this the dessication point, because this word seems to describe the effect produced upon the tissues better than any other term. When a thermic intensity at the dessication point is generated, controlled and sustained upon or into a given area of tissue, dehydration of the tissue ensues. The cell capsule is ruptured and what before was a living tissue, is then transformed into a dry, inert, sterile mass. (These facts have been proven by microscopical studies.) Just enough heat is generated to devitalize tissue without actually carbonizing it. At the dessication point, living or cadaveric tissue as well as vegetable matter or substances such as hard soap which has been hydrated, may be dehydrated through a sheet of white paper without charring or discoloring the paper, and the transformed matter pulverized between the fingers. The heat is transmitted through the paper without discoloring it for the reason that the thermic degree is not carried to the fusing point, and the paper is not a sufficient

obstacle to prevent the heat from being transmitted through it. If the heat intensity is increased, the paper will be charred, and if carried farther, it will ignite. This dessicating action may be superficial or carried deeply into the tissues at will. Eminent physicists are in accord with me as to the correctness of the dessication principle and I submit this method as an addition to our armamentarium for effectively meeting some surgical conditions."*

In other words, the carcinomatous cell is at some time a localized affair—it is a recognized

Fig. 4. A—Basal cell epithelioma of the upper lip in a woman, aged 72, referred by Dr. William Hamilton of Philadelphia. One dessication treatment was given in September, 1914. B—Result. Note absence of contracted scar. No recurrence in nearly four years.

fact that all new cell formation is less resistent than older cells and tissue, and for this reason the cancer cell is destroyed far beyond the healthy cell by the use of the high-frequency current.

During a period of two weeks, I saw between three and four hundred cases of all kinds.

Some very extensive and large; all of the group had been tampered with in one way or other.

Two cases in particular were cancer of the tongue. In one, the organ was completely removed by the high frequency current. The patient had a slight hemorrhage five or six days following. As to the ultimate outcome, I cannot say, but I am fearful of a recurrence in this

Fig. 5. A—Basal cell epithelioma, involving tissue and bone at angle of jaw, in a man, aged 73, referred by Dr. John Hedges of Philadelphia. The roentgen ray had previously been used without success. One dessication treatment under local anesthesia was given in March, 1917. B—Result of one treatment. Note absence of contracted scar. No recurrence in one year and a half.

particular case, because the induration continues into the floor of the mouth. The second case was a small epithelioma of the tongue, with every chance in the world for a complete cure.

Another case of leukoplakia along the inner side of the cheek; very extensive. Dr. Clark said that he thought the patient would make a permanent recovery.

I saw more than half a dozen such cases that

Fig. 6. A—Epithelioma involving nose, cheek, brow, eyelid, globe, and bones of orbit and antrum in a woman, aged 59, referred by Dr. T. L. Bradford of Philadelphia. Roentgen treatment had previously been used unsuccessfully. One intensive electrothermic coagulation treatment under ether anesthesia was given in March, 1917. B—Result of one treatment. No recurrence in year and a half.

Fig. 7. A—Epithelioma of lower lip, a recurrence after surgical excision, in a man, aged 75, referred by Dr. Paul Cassidy of Philadelphia. One dessication treatment under local anesthesia was given in April, 1915. B—Result of treatment. Note absence of contracted scar and regeneration of lost tissue in lip. No recurrence in more than three years.

Fig. 8. A—Epithelioma involving upper lip, antrum, septum, nose, alveolus and hard palate, of three years' duration, in a man, aged 66, referred by Dr. J. D. Graber of Royersford, Pa. Previous treatment by plasters and the roentgen ray had been unsuccessful. The case was pronounced hopeless from a surgical standpoint by Dr. John Chalmers DaCosta of Philadelphia. One electrothermic coagulation treatment under ether anesthesia was given, March 1, 1916, and two slight recurrences were treated under local anesthesia by the dessication method. B—Final result, with no recurrence in two years and five months. C—Reconstructed features by the sculpture method executed by Major R. Tait McKenzie of Philadelphia and Mrs. Alan Chesney of Baltimore. A plaster cast was made and the lost features built out in clay. A copper plate of suitable thickness was deposited on the cast by electrolysis and then silver plated. This plate was painted to match the tint of the skin, the mustache added and the plate attached to the rims of the glasses. A similar plate may be kept in place be means of spirit gum without the aid of the glass frames if desired. A plate is under construction to replace the hard palate and with artificial upper and lower teeth, in the hope that the patient may improve articulation and better masticate his food.

* American Journal of Obstetrics and Diseases of Women and Children; Vol. LXXII, No. 1, 1915.

were cured or in the process of getting well.

I saw probably fifteen cases of recurrent cancer of the cheek or jaw or tonsil that had been operated by the knife by the best surgeons of Philadelphia. Some of them were in the process of complete recovery, while others had metastases elsewhere following the high-frequency current.

I saw three cases of lupus of the nose; two of them well and the other in the process of getting well.

The greatest number of cases were confined to the skin and these were so satisfactory that a cure was promised in many instances.

During the two weeks of my stay I saw only one recurrence at the site of the old lesion. This case had not been seen in more than two years. There were quite a numbr of cases (six or eight) that had metastases to other parts.

There were other cases that were beyond reach.

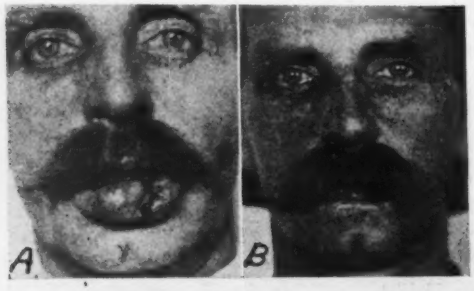


Fig. 9. A—Epithelioma involving the whole of the lower lip, in a man, aged 48, referred by Drs. G. C. Bird and J. F. Ulman of Philadelphia. One dessication operation to the lip was performed under local anesthesia. B—Result of dessication treatment. Note absence of contracted cicatrix and regeneration of lost tissue. No recurrence in lip in four months.

During these two weeks I saw more cancer cases than I had seen in my lifetime. From my best judgment I should say that this particular method is doing more to eradicate this particular kind of carcinoma than anything else up to the present time irrespective of radium and X-Ray, and my conviction is that in the near future a way will be devised to use it in the abdomen.

Dr. Clark reports an extensive carcinoma of the nose and accessory cavities—cured. (I will show you the picture.)

This very case illustrates the possibility of using the current in cavities, and for that reason I am going to use it in the first case of carcinoma of the larynx that has a chance for recovery.

I am going to do it in the following way: First, do a tracheotomy and as soon as the patient can handle the tube well, will do a laryngofissure, opening the larynx wide, applying the current deep to all the involved parts. Keeping this wound open until such time as I consider it should be closed. This is as I see the procedure today. There are so many conditions that may arise that one does not anticipate and therefore, my procedures may be radically different. If I can bring a single case to a successful issue, the procedure can be further modified in one way or other to make possible the cure of this distressing affliction.

Case A—Age 45. Male. Farmer. Referred by Dr. Blake Franklin, November 15, 1918. Up to the present time the patient has been in the best of health. About November 1st, had the wisdom-tooth of the upper jaw extracted. Following this, a fungus growth appeared in the tooth socket. This was examined at the Pathological Laboratory of the University of California and pronounced carcinoma. A few days later, patient was directed to me to see what could be done with the use of this particular current. Another specimen examined by St. Francis Hospital Laboratory, confirmed the original diagnosis. As there was considerable pyorrhoea of all the teeth, they were all removed and in two weeks proceeded with a light high-frequency apparatus. Patient returning in one month. Additional growth had appeared, again confirmed by laboratory examination and another more extensive operation performed, this time going well into the bone. When the operation was completed, no induration could be felt at any place. In less than a month, he returned again with a fungus-like growth confined to an area about the size of the end of the small finger. Carious bone from the previous operation had not entirely separated and as this bone was not loose, it was not disturbed. Two months following this, I removed five different pieces of bone; the smallest being larger than the ordinary bean. The largest piece, about two inches long and a quarter of an inch wide. Going over this entire cavity with a probe, I could not detect any additional uncovered bone. The case should heal rapidly. If it does not, I will again go over the field more extensively than ever.

Dr. Clark tells me that a second, third and fourth application may be used with a possibility of effecting a cure; that you have every chance for a cure as long as the glands in the neighborhood remain free. This is not exactly so, because he has had some cases that have died of metastases to a distant part.

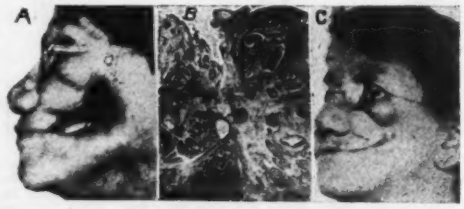


Fig. 10. Squamous cell carcinoma involving antrum, alveolus, hard palate and buccal surface on left side in a woman, aged 60, referred by Dr. E. B. Miller of Philadelphia. Since involvement was extensive in this case and some of the diseased tissue was inaccessible, preliminary surgical removal was done by Dr. G. M. Dorrance, followed immediately by electrothermic treatment. A—Result of this treatment. No recurrence in fifteen months. B—Low power photomicrograph (showing prickle cells) on which diagnosis was based. C—Result of plastic operation in which tissues were separated from bony attachments, and cheeks drawn together and sutured.

AVIATION'S DEBT TO MEDICINE.*

By CHARLES G. STIVERS, M. D. (Los Angeles), Major, Medical Reserve Corps, U. S. Army.

Aviation presents two problems: one dealing with the mechanical, the plane and its equipment, and the other with the flier and his endowments and adaptations.

With the mechanical this paper has nothing to do, but deals with the choosing of the men who were to be trained as pilots and the care of them after they had learned to pilot planes.

This care of the pilot during the recent World War included the determination of the fitness of various fliers for all the different military activities. Men were selected for pursuit, for bombing, for observation—for high and low altitudes and for ground work only.

It is my contention that many valuable lives have been saved by this care and that aviation has been safeguarded by medical science.

Those unfit to fly at all because of gross physical defects have been refused admission to the aviation section. By Medical Research Boards, with headquarters at Mineola, L. I., and branch laboratories at various aviation schools, the further classification of every pilot in the air service has been or will soon be determined. In this way, there have always been available for the demands of the service, lists of men whose abilities were a matter of knowledge.

A pilot who could not stand a low oxygen test was forbidden to fly above his proper level. Pilots who are able to go to high altitudes are allowed to do so. Men who under the low oxygen test showed marked inability to adapt themselves to the air have been forbidden to fly at all and have been placed in their proper status as ground officers.

When we entered the war, the selection of as large a number of aviation candidates as could be obtained was delegated to a group of specially trained physicians, who conducted numerous Aviation Examining Units. These units were located in the large cities of the United States, usually associated with medical colleges and hospitals having well established eye, ear, nose and throat clinical staffs.

An officer of the Medical Reserve Corps, usually a captain, was placed in charge of the unit, which was composed of a number of eye, ear, nose and throat specialists and internists—civilian consultants so-called. The place of examination was usually in the building where the clinics of the medical college or hospital were held. Applicants appeared early in the morning at this unit, and were given a strict examination to determine their fitness for selection as candidates for training as pilots. The candidates were often college men, many being trained athletes, but some of our noted aviators have been of slight build, with practically no previous athletic training.

In the physical examination emphasis was placed on normal vision, hearing, and balance sense, together with normal respiratory, circulatory, digestive and kidney functions.

The strictness of the examination is seen by the fact that in earlier days the percentage of rejections from all causes was often as high as 60 to 75 per cent. of candidates examined. The mental examination which followed the physical was designed to show the mental alertness but not the depth or extent of the candidate's mental equipment. This examination rejected as large a per cent. as the physical, so that those candidates who were finally chosen to be sent to a ground school were, in every sense, picked men.

In the later months of the war enlisted men of the aviation section and other branches of the service were allowed to take the examination. Being already of physical excellence, fewer rejections followed and the percentage of successful candidates rose accordingly.

The physicians who composed the Aviation Examining Units gave their time and professional skill absolutely without pay. The sum total of their voluntary contributions, if measured in money, would amount to a very considerable "Liberty Loan" indeed.

The equipment of most of the medical colleges in this country was placed at the disposal of the aviation section without any charge for rental of examining rooms.

After passing the physical examination, successful candidates were sent to a ground school, usually connected with and contiguous to a large university. At the ground school the candidate became a member of the Enlisted Reserve, and was trained in military drill and lived the life of the soldier.

After graduation from this ground school came a course of training at a School of Flying, ending, when successful, in the commission of the candidate as an officer in the aviation section.

Flying cadets and pilots are constantly under the supervision of trained medical officers called Flight Surgeons, the nature and scope of whose duties are the classification and care of fliers.

It was formerly the custom to speak of pilots having the aviator's temperament, but it is generally conceded that the average picked man can be taught to pilot a plane. The altitude at which he can successfully operate his plane, is a matter that is determined by the Flight Surgeon and his unit connected with the Flying School.

The conquest of the air by the earlier pilots was thought to be near the supernatural—a view held by the masses concerning the early history of the accomplishment of skill in many of the arts, sciences and professions. In relation to flying, it was thought that some special sense enabled pilots to maintain the mastery of their planes in the air, but much of this fog of ignorant conclusions has been dispelled by a more intimate study of the genesis and mechanics of flight.

It is true that aviation demands a high degree of physical perfection, but almost anyone with normal sense of balance, normal vision, hearing and internal ears (semi-circular canals and cochlea), with a healthy body and an alert brain, can be taught to fly.

* Read before the Eye and Ear Section, State Medical Society, Santa Barbara, Cal., April 15, 1919.

The greatest medical achievements of the war were, first, the Carrel-Dakin method of wound treatment; second, the use of bone-grafts; third, plastic surgery, especially of the head; and fourth, the selection and classification of aviators.

The classification of aviators alone is a distinct discovery made during war times; the others, although great and useful, were all being used by medical men before the present war.

Having learned "straight flying" and the elementary branches, the pilot becomes the subject of study to find out his particular capabilities for more advanced work. In order to be master of actual combat flying, the pilot must have learned "stunt" flying—that is, must be able to take his plane into and out of all tight places. He must be able to loop, spiral, nose-dive, tail-spin, or side-slip at will. His judgment must be unerring—to tell him when and how to do these necessary stunts—and his physical condition must be such as to answer all demands during their performance. His motion-sensing apparatus and his ears must be in a healthy functioning condition, for it is the flier who flies by his sense of being at all times balanced in the air, who is the most at home in the air. Your pilot who depends on his eyesight to tell him his position in space is apt to find himself in many places where his eyesight is useless to him; for instance, at night, or in a dense cloud, or thick fog, or while experiencing the vertigo induced by the whirls of a loop, spin or dive. The flier by sight is apt to be a careful and painstaking pilot, but not a brilliant one. The combat pilot must be able to stand the highest altitudes, to adapt himself to low oxygen per cent., for the reason that to escape anti-aircraft guns he must go up at least 16,000 feet.

It is an axiom that the higher in the air a plane is the safer the pilot is, for the reason that he escapes shell-fire and has plenty of room to observe and maneuver. Crashes occur most frequently when "stunts" are pulled too near the ground.

How, then, to pick out the stunt flier and the high flier? The stunt flier should be a man who has learned to interpret the various sensations of vertigo produced in flying and how to correct them.

All vertigo depends on the reaction of the fluid in the semi-circular canals, and this reaction is the same whether induced by a laboratory experiment in a specially designed whirling chair or apparatus, or in actual flying.

For obvious reasons, no clinical study of vertigo can be made while flying, but cleverly designed apparatus has been devised for the testing of vertigo on the ground.

The actual demonstration to the pilot of the vertigo produced, and the corrective methods to be employed, has been the means of preventing many crashes.

It is true that the veteran stunt flier is not usually upset by the vertigo produced by stunting, because of the great practical experience he has had, but a knowledge of the principles involved has undoubtedly saved many a pilot's life.

The actual testing of an aviator on the ground, and not in the air, where he would be in danger of a fatal accident, is one of the most brilliant achievements of recent years and is carried out by the use of an apparatus known as the orientator. It resembles somewhat the cockpit of a plane suspended in concentric rings. The movements (or changes of position) can be made in any plane and any direction except actual forward or backward progression, and are governed by the pilot seated in the apparatus. His controls are like those of an airplane and he can make any desired evolution, such as the spiral, loop, etc., at any desired speed and for any number of revolutions.

He learns in safety of the reactions set up in his internal ear canals during these evolutions, and acquires a tolerance for the vertigo produced and learns how to adopt a corrective posture to mitigate or do away entirely with its effects. Let us see how this is done. The internal ear has three sets of canals or minute tubes holding fliud, placed at right angles to each other. The fluid is free to move in any direction, to follow the movements of the head. Fluid movement sends messages to the brain, where it is interpreted as body movement.

Movement of the fluid in the internal ear canals occurs during either flying or laboratory examination. This circulation of fluid is always in a definite direction, depending on the direction of the bodily rotation. If this rotation be suddenly stopped or changed, the fluid in the canals keeps on moving by the force of its momentum. This is interpreted by the brain as body movement, but not being in accordance with facts, sets up a dizziness or vertigo very disturbing to the pilot unless he knows how to adopt corrective measures.

A brief review of the three planes of vertigo: horizontal, frontal and sagittal, will help us to understand the application of corrective measures.

Each semi-circular canal (both right and left ears react together) when stimulated sets up a vertigo in its own plane. Horizontal vertigo is less disturbing than vertical (probably from an acquired immunity: we are constantly turning in a horizontal but hardly ever in a vertical plane).

When a vertigo sufficient to upset the flier is produced in the vertical canals, the effects can be lessened by bringing the vertical canals into the horizontal plane—that is, by turning the face downward. Pilots learn to interpret vertigo, and the more often it is repeated the greater the immunity set up.

The study of vertigo during laboratory experiment has led to the application of corrective measures to mitigate the vertigo induced by stunt flying.

THE LOOP. In this stunt the vertical canals are stimulated in the sagittal plane—the body being whirled over and over head first, making complete revolutions as does the acrobat in tumbling. The correction for the vertigo in flying is made by placing the head sharply over to rest on the shoulder.

TIGHT SPIRAL. The body is practically parallel to the ground, but the eyes are fixed on the horizon. The vertical canals are stimulated in a plane parallel with the ground and the endolymph current is horizontal. When the spiral is straight-

ened by the aviator coming out of his spiral, the position of the body changes to vertical, and the vertigo becomes vertical in a sagittal plane (from before backward, or opposite to the direction of turning).

To test this in the whirling chair let the candidate be placed with his head resting on one shoulder. The vertigo is the same as that induced by the spiraling of a plane.

The remedy for the aviator is to throw his head over on one shoulder when coming out of the spiral, since by doing so he has produced the impression that the vertigo is horizontal and not vertical—hence not so disturbing.

SPINNING NOSE-DIVE. The plane is approaching the earth rapidly in a whirl with its nose (engine or front end) down. The pilot's body is nearly parallel to the ground, and the fluid in the vertical canals is set in motion in a frontal plane. When the plane "comes out" of the nose-dive and straightens out, the position of the body and head being altered, there is a vertigo produced in a vertical plane, but in an opposite direction to the direction of the spin. This produces a sensation of moving in an up-and-down plane, which upsets the pilot's sense of equilibrium. He is apt to attempt to overcome it by throwing his head into a horizontal position, and, by kicking his controls, throws himself into another tail-spin.

The remedy for the aviator is to keep his head down when coming out of the nose-dive, so that the vertigo remains in the horizontal plane.

THE REVERSEMENT OR TURN OF DIRECTION. In this stunt the fluid in the vertical canals is set in motion. In the first or loop part of the reverse, it is moving in a sagittal plane. In the following part of the reverse, the fluid in the canals is stimulated in a frontal plane. The vertigo (if any) of the sagittal plane is lost in that of the subsequent frontal plane, which is the one the aviator has to come out of when his machine returns to a level flight. The vertigo being on a frontal plane, the correction to be made by the pilot is to keep the head well forward and down when about to come out of the reverse. By testing aviators with laboratory apparatus such as the whirling chair and the orientator, they may learn in safety the correction of induced vertigo. As the vertigo produced in flying is the same as the experimental variety, the practical application may be seen at a glance.

As repetition produces a tolerance, this may be obtained, to some extent at least, in the safety of the testing laboratory. Experienced aviators, who have been tested by the otologist in the experimental whirling to simulate actual flying conditions, have testified to the corrective value of certain changes in the position of the head, declaring that they operated the same whether flying or while being tested on the ground.

It is obvious that the knowledge of how to avoid crashing to earth as a result of vertigo, has saved many valuable lives.

The classification of aviators—their ability to withstand low oxygen tension—is determined by a test with the Henderson rebreather apparatus. During this test the candidate is obliged to rebreathe his own expired air and so exhausts the oxygen. The percentage of oxygen he can remain efficient on represents practically a certain altitude to which he is adapted.

Atmospheric air contains always 21 per cent. of oxygen, but the atmospheric pressure lessens as altitude is attained and the absorption of oxygen by the blood falls as altitude rises and barometric pressure falls.

During a low oxygen tension test, three standardized sets of stimuli are used:

1st. Lamps which flash a white or red as the contact is correct or not.

2d. An index hand, whose relative position on a dial may be altered by the operator.

3d. A motor running at either of two speeds, audibly different, which can be changed from one to the other at will.

The candidate has three tasks:

1st. As soon as a light flashes on the board before him he must touch with a stylus held in the hand, a brass button surrounded by a brass washer. The touch being correctly made while the stimulus lamp is lighted, a check lamp flashes. If the washer is touched (by fumbling or groping) a red error lamp is flashed.

2d. The motor is to be kept at a certain (the lower) speed by the candidate operating a foot control—thus correcting the advancing of the speed by the operator.

3d. The index hand must be kept at a certain position on the dial. The operator may vary it at will by a control, the knowledge of the variation being conveyed to the candidate's brain by his sense of sight.

The psychological observer, who also operates the dial and noise mechanisms, notes and makes a record, using a system of symbols, of the appearance of the characteristic effects of asphyxiation on the attention and on the co-ordination of voluntary movements up to the final point of complete inefficiency—beyond which it is unnecessary and inadvisable to go.

Clinicians observe the blood pressure, respiration, pulse-pressure and the effect on sight and hearing.

On the appearance of signs of acute distress, affecting any or all of the systems under observation, the experiment is terminated at once.

By this test, the tolerance of the candidate is established and made a matter of record.

Pilots, after oxygen tension tests are placed in one of five classes:

1st Class or A. A. Particularly resistant to low atmosphere pressure, suitable for pursuit work, etc.

2d Class or A., with no restrictions on altitude, but in whose case some mild condition of impairment shows during the test, slight cyanosis or slight impairment of judgment.

3d Class or B. Should not attempt flights above 15,000 feet.

4th Class or C. Should not fly above 8000 feet on account of some condition such as persistent high blood pressure.

5th Class or D. Should not fly at all. Those cases with undiagnosed organic heart disease showing only under stress of low oxygen.

This class is not necessarily disqualified for ground work.

The signs of a lack of oxygen may be manifested through the failure of any of the vital systems, and it has been found that the symptoms disappear when oxygen is given to a candidate during a test.

It would seem that oxygen in tanks available for the pilot's use at all times would be an essential part of every plane's equipment.

AUDITORY FUNCTION. The hearing shows no marked impairment under a Henderson rebreather test until the altitude attained is such as to cause an acute functional derangement of all of the higher brain centers.

In a plane the hearing is often temporarily impaired, especially when descending. This is due to the difference in the atmospheric pressure of the air in the middle ear and that in the Eustachian tubes and auditory canals. Occasionally this pressure has been so great that rupture of the drum resulted.

Acute otitis media has been caused by the irritation and congestion from rapid changes in altitude.

Altitude does not seem to affect disastrously the motion-sensing function.

Re-examinations of aviators at flying fields are made at short intervals, and pilots who are not in perfect physical condition are forbidden to fly. The lives of many men have been saved by keeping them on the ground when they were unfit because of staleness or illness.

406-7-8 Auditorium Bldg.

References.

Jour. A. M. A., Oct. 28, 1918: "Medical Studies in Aviation."
Jour. A. M. A., Oct 28, 1918: "The Ear in Stunt Flying"
Major Lewis Fisher, Dec. 14, 1918.

ABDUCENS PALSY—TRANSPLANTATION OF VERTICAL RECTI IN THREE CASES.*

By RODERIC O'CONNOR, M. D., Oakland.

The surgeon and internist should be interested in this subject because this condition usually complicates some injury or disease. Also the otologist because the symptom occurs occasionally in suppurative process in the apex of the petrous portion of the temporal bone (Gradenigo Syndrome). *They should also be informed that relief is possible in spite of statements to the contrary, in most of the text-books on ophthalmology.* Therefore these cases should not be dismissed as incurable or told to wear a patch over one eye permanently but should be referred to the ophthalmologist early in order that the progress may be watched and operation done as soon as it is certain that power is not returning.

The operation should be done before contracture starts in the internal rectus because it may then be possible to avoid extensive tenotomies and so obtain a better final functional result. Usually a paralysis shows early improvement and a fairly rapid progress toward its final position. If the paralysis is *complete* at the end of three months from its time of onset, in spite of proper treatment, I should say there would be too slight a prospect to warrant further delay.

In cases of incomplete paralysis operation should be delayed till progress toward cure has stopped. In these cases I believe better average results would be obtained by doing this operation omitting tenotomy of the internus than by the usual tenotomy with shortening of the externus. In cases of congenital paralysis, or absence, of the externus, contraction of the internus seldom occurs, so there is no great need for hurry for that reason. However these cases should be operated as soon as a general anesthetic can be given in safety in order to save the vision of the squinting eye and put the *pair* in shape to develop binocular vision.

In a complete case the eye stops, in outward rotation, at a position about 10 degrees internal to the median line of the orbit, therefore if the eye can reach that point the paralysis is not complete and the prospects are better for a good result.

My cases are all of the complete variety, the first being congenital the second acquired but operated before contracture of the internus had set in, the third acquired but operated after contracture which interfered with a complete result in spite of the excellent outward rotation secured. In the second case the result was obtained without a complete tenotomy of the internus, in fact without even a lengthening. The details of the three cases follow.

Case I. This was a girl of 8 in which the squint had existed to the knowledge of the mother since the second year and in fact was probably a congenital case. Fig. 1, while a picture of another case, shows the lack of outward rotation as it was a complete paralysis. There was about 35 degrees of arc squint with hyperphoria in the squinting eye. Operation was done August 4, 1916 with the assistance of Dr. E. F. Glaser. No tenotomy of the internus as I wished to prove than any outward rotation obtained was due to the transplantation itself. Seventeen days later outward rotation was 25 degrees of arc with 10 degrees remaining squint. So the internus was lenghthened on this date. One week later the eyes were straight cosmetically and outward rotation was between 40 degrees and 45 degrees measured on the perimeter by light reflection test. Two years later she tested esophoria one degree in primary position, no diplopia within the limits of her glasses, binocular vision of the second degree, and an outward rotation of 35 degrees. The result therefore was practically perfect both from the cosmetic as well as the functional standpoint.

Case II. This case was referred to me by Dr. Louis Green who assisted in the operation. The paralysis was complete and caused by a fracture of the skull received eight months before date of operation. There was an esotropia of 30 degrees

* Read before the Forty-eighth Annual Meeting of the Medical Society of the State of California, Santa Barbara, April, 1919.

Fig. 1. Upper. Shows the degree of squint. Middle shows position of eye in attempting to reach the primary. Notice light reflex on cornea is external to its center proving failure to reach the primary position. Lower. Shows position in attempting to look at finger and the failure again to reach even the primary position. By noting the features it can be seen that there was no change in position of head. This is a picture of case 2 but all three were identical as far as position of the eyes.

of arc with one-half degree hyperphoria. Outward rotation stopped well short of the primary position thus making it a complete paralysis. Operation done February 19, 1917. In general the method was as in the other case but was extremely difficult as he was almost unmanageable. Satisfactory slips from the vertical recti were not obtained. I tried to increase the effect by suturing them closer to the externus attachment thus increasing the tension and decreasing my final result. No tenotomy of any kind was done at first operation. Feb. 26th he tested 6 degrees esotropia with hyperphoria unchanged. Held primary position without diplopia and had an outward rotation of 10 degrees. Feb. 27th a central tenotomy of the internus was done leaving a couple of fibers at each margin. The immediate result measured exophoria 5 degrees. On March 5th he held primary position easily and had an outward rotation of 16 degrees. On this date he disappeared and I have not seen him since. I had intended to either complete the tenotomy or convert it into a lengthening which should have increased the outward rotation by at least 10 degrees judging from the other case. The result in this case also shows the advantage of working in the absence of contractures.

Case III. This was referred to me by Dr. Galbraith of Oakland. It was a complete acquired paralysis of five years duration in a man of 50 years. There was considerable contraction of the internus and the squint measured 65 degrees. Contraction was also present in the internus of the other eye which also had a weakened outward rotation. Operation on Dec. 5, 1918 under cocain anesthesia. He was an excellent patient and all the steps of the operation were carried out entirely to my satisfaction. Because of the contracted internus a full tenotomy was done. The immediate result was a reduction of the squint to about 20 degrees and an outward rotation of about 20 degrees beyond the primary position. Healing was uneventful and on Dec. 23rd there was a remaining squint of 15 degrees with an outward rotation between 30 and 35 degrees both measurements being made on the tropometer. Further work in this case will be needed to secure a complete cosmetic result and it is my intention to lengthen the internus of the other eye because of its contraction and possibly cut the inner halves of the transplanted vertical recti thus still further increasing the outward rotation.

Results: These are to be judged from two standpoints, cosmetic and functional, and I think the latter is the more important for if possible of attainment the other is bound to follow. This statement should be qualified by providing for operation before contracture starts in the interni. We all know how difficult it is to obtain satisfactory results in cases of long standing internal squint of the monocular type where the externi are atrophic and the interni contracted. In all the successful cases the results appear to be permanent and even tend to get better as time goes on, and the muscles with their innervations learn to adjust for the new relations.

The fact that binocular vision has been restored in a number of the reported cases seems to show that the muscle action is guided entirely by the fusion sense irrespective of what individual muscle or nerve is employed to secure the necessary movement. If this is so the transplantation principle can be employed in other paralyses such as:

1. Of the internus of which the most frequent is that following too extensive tenotomy for convergent squint. In this case the inner halves of the vertical recti would be used.

2. Of the superior rectus in which case we would transplant the upper halves of the horizontal recti. I have two cases of this kind under observation at the present time neither of which have binocular vision so there would be no worry as to diplopia.

3. Of the inferior rectus in which the lower halves of the horizontal recti would be used.

4. Of the superior oblique for which there appears to be no available transplant and it is a frequent paralysis. For this there seems to be only tenotomy of the inferior oblique or Jackson's operation of transplanting the superior rectus further out on the globe and in this way substituting in part for the pull of the oblique.

In looking over the literature available to me I have been able to find, including mine, thirteen cases reported one of which was of double congenital absence of externi and therefore required two operations. The appended table gives the data in each case as given by the reporter. It will be noted that it is far from exact in most of them. However it shows in a general way that the cosmetic results were complete in nine and in four the remaining squint being slight relatively. As to the functional results six secured over 30 degrees or outward rotation, one sixteen degrees (without an appreciable amount of work on its internus), while in the other six either none or extremely slight degree. With such results possible in an otherwise hopeless condition there is no doubt but that the patient should be given the chance.

Technic of the operation as done by me. In the March number (1919) of the American Journal of Ophthalmology I reported my first case and there went into considerable detail as to the operative technic. It is hardly worth while to repeat here as you all undoubtedly see that journal. My modifications of the operation consist in shortening a middle section of the externus, making slips from the upper and lower portions of the tendon to bridge in the space between the vertical recti transplants and the externus attachment. In this way the object desired is gained without tension on sutures and at the same time something is gained by the shortening of the middle portion of the externus, both in the position and possibly in lessening the chance of causing a vertical deviation by our operation. As to cutting the interni. This should not have to be complete if we operate before contracture is established as shown by two of my cases, one of Hummelsheim's, and Moran's.

Summary of Cases Found in the Literature

A. Cases of complete paralysis.

1. Hummelsheim's (second). One of acquired of eight months' duration in which an "excellent" cosmetic result with 45 degrees outward rotation and no diplopia except at extreme limit of rotation, was secured.

2. Woodruff's (second). A "good" cosmetic result but no outward rotation beyond primary position.

3. Stuelp. A "good" cosmetic result. Outward rotation "very slight."

4. Todd. A case of congenital absence of both externi. Both sides operated. "Small amount" of remaining squint and "some motion" outward.

5. Tenney. Had only "some improvement" in squint with "slight" outward rotation. Stitches slouged out early.

6. Weiner. Had an "excellent" cosmetic result and about 30 degrees outward rotation.

7. Moran. This was a case of only three months' duration in which an "excellent" cosmetic result with "free" outward rotation (probably over 30 degrees) was obtained.

B. Cases of incomplete paralysis (outward motion to the primary position).

1. Hummelsheim's (first). In this a complete cosmetic result with 30 degrees outward rotation was obtained.

2. Woodruff's (first). Had a satisfactory (almost straight) cosmetic result but no outward rotation.

3. Harris. Had an "excellent" cosmetic result with "praticcally full temporal rotation" (probably well over 30 degrees).

THE TREATMENT OF FRESH AND UN-UNITED FRACTURES OF THE FEMORAL NECK.*

By Ellis Jones, M. D., Los Angeles.

Of all types of fractures an intra-capsular fracture of the neck of the femur is the most disabling. It is the fracture with the highest disability rating and the poorest functional end results. When treated by the usual conventional methods of extension, either by so-called Buck's Extension, suspension, or traction methods, the percentage of poor results is startling.

Scudder reports only twelve per cent. of good results,—many years after the original fracture, in which the leg was functionally useful. Of one hundred and twelve cases treated in Bellevue Hospital in 1906-7, only thirteen per cent. recovered good function. The British Fracture Committee reports only twenty-three per cent. of good functional results.

We have personally observed the end result in thirty-eight cases treated by suspension, traction, or Buck's Extension, with not a single good result.

Such end results in fractures of the femoral neck have been so extraordinarily bad in our observation as to lead to this critical analysis of the treatment employed.

We are forced to the disquieting conclusion that either the profession is unaware of the eventual poor results of the original treatment or else the profession is not actually aware that a better method exists.

Text books prescribe two laws of treatment:

1st: "Treat the patient not the fracture."

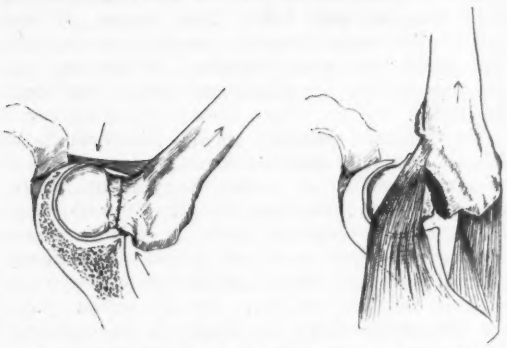
2nd: "You must not break up the impaction." There is some truth in this but the effect of such epigrams is bad. The literature on hip fractures is tremendous but of little practical value. The most satisfying contributions in recent years have been made by Royal Whitman and Frederick Cotton.

In the thirty-eight cases personally observed, the treatment apparently has been to put the patient up in some form of adhesive extension and traction, and trust to obtain the good results called for in all respectable text books. Then when union did not occur, to regard it as a sad failure due to the patient's age or inherent inability to produce new bone.

No loose intracapsular fracture of the femoral neck ever unites with firm bony union when treated by traction in the straight line of the body because it is impossible to obtain accurate anatomical reduction by this method. The distal fragment remains anterior, and the normal angle of the neck of the femur is abolished. An impacted fracture may unite if the extension does not break up the impaction, but it is impossible for any *un*-impacted fracture of the neck so treated to unite.

In a fresh fracture union is impossible unless the fragments are in contact no matter how adequate the blood supply or how great the resistance to absorption of the head of the femur. Apposition or contact provides the opportunity for repair.

*Read before the Forty-eighth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1919.



A. Illustrates the effect of traction in the straight line of the body. The fracture is not reduced—apposition not obtained—shortening and deformity persist.

Apposition is obtained only be extreme abduction —the so-called Whitman method. The technique is simple and easy.

The patient is anesthetised lightly; manual or mechanical traction applied and the leg abducted to the extreme limit. An assistant internally rotates the leg, lifting the trochanter forward, and a plaster spica is applied from the toes to the nipple line, with the leg slightly inverted, and strongly abducted. The patient is kept recumbent, with the head of the bed elevated, and the cast is worn for three months, followed by a short plaster spica. Weight bearing is not permitted until the sixth month. This method has given good results in Whitman's hands.

There are several so-called objections to this method. The aged do not bear anesthesia well, but a light gas and oxygen anesthetic is all that is required. With the head of the bed raised we have little to fear from static pneumonia.

Cotton points out the fact that impacted fractures of the neck of the femur almost invariably unite, and advocates artificial impaction of loose fractures. His method is simplicity itself: The fracture is reduced by traction and abduction until the legs are equal. A felt pad is placed over the trochanter and several blows from a heavy wooden mallet drives the distal fragment into the head. A loose fracture is thus converted into an impacted one. Cotton reports twenty-one cases with one failure.

In six cases of fresh fracture of the femoral neck, we have used a combination method with certain simple modifications. The patient is anesthetized and the Whitman method of abduction employed. With the leg in extreme abduction the fracture is impacted by Cotton's method, and a plaster cast applied with both legs in extreme abduction. This cast is applied from the toes to the nipple line on the affected side, and down to the knee on the well side. This modified double spica adequately and persistently maintains reduction and prevents slipping of the pelvis.

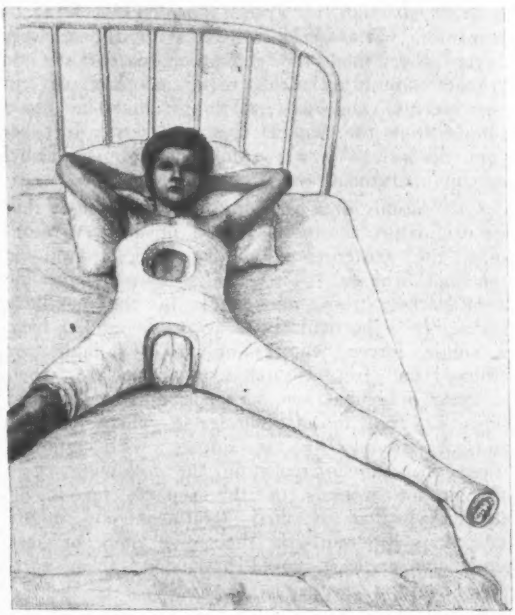
This is the only fracture in the body in which overcorrection should be obtained at reduction. This overcorrection can be obtained only by extreme abduction.

Six such cases so treated have given excellent functional results. In two cases the hip was already impacted in poor position, and we did not hesitate to break up the impaction and reimpact in extreme abduction.

Weight bearing should not be permitted until the radiograph shows firm bony union. We have not found it wise to permit weight bearing before the eighth month. The average length of time before satisfactory function was obtained was thirteen months. Our reason for advocating overcorrection is that during the early months of weight bearing some yielding of the neck may occur which explains the coxa vara observed in cases otherwise anatomically satisfactory.

We realize that our cases are limited in number, but the results are in striking contrast to the results obtained by traction in the straight line of the body.

What are we to do with our cases of nonunion? We have been in the habit of transplanting, using the tibial bone graft and pegging it through the neck and into the head of the femur. In nine cases we have had four definitely good results. Five cases were failures. It is unreasonable to hope for successful results by any such method when absorption of the head has already occurred. Absorption of the head undoubtedly occurs early in the fracture, and our results from



B. Diagram to illustrate the anatomical reduction obtained by the Whitman method of abduction. Note the extreme abduction necessary to correct the fracture deformity.

bone transplantation are still problematical. After a year or more of undoubted nonunion removal of the head and an arthrodesis of the hip joint is our only resort. A stable, firm, dependable joint is infinitely to be preferred to a painful yielding pseudo-arthrosis. Of the thirty-eight patients examined, years after the original fracture of the neck of the femur, only two were working, and these two were not fit to work. The laboring

man with a pseudo-arthrosis, secondary to an ununited fracture of the femoral neck, is a total economic loss. He is not such a loss with a firm stable hip properly arthrodesed.

SUMMARY.

(a) The extension method of treatment of fractures of the femoral neck gives results far too poor to justify its use.

(b) The Whitman method is simple, reliable and efficient, and has given good results in Whitman's hands.

(c) The author advocates a combination of the Whitman abduction and the Cotton impaction methods supplemented by an attempted overcorrection in reduction of the fracture, and the immobilization obtained by a double plaster spica. The abduction should be complete in all cases and weight bearing should be prohibited until the end of eight months. Such a method promises to prove a satisfactory solution to a most difficult surgical problem.

1202 Brockman Bldg.

WAR WOUNDS OF THE SINUSES WITH X-RAY PLATES.*

By HAROLD A. FLETCHER, M. D., San Francisco.

The problem of instruments for sinus work was a very hard one in France until just before the armistice. The specialist had at his disposal very little other than the regulation ear, nose and throat canvas roll, the regulation box of eye instruments, and a few things that he could obtain from the general operating sets. Just before the armistice our requisitions for additional special instruments were being filled.

One serious drawback to the army roll is that its originators absolutely forgot, or did not recognize, the existence of the ethmoid, frontal or sphenoid sinuses. They did, however, provide a satisfactory trocar and canula for the maxillary sinus. It is particularly disagreeable not to have a single forcep, curette or probe suitable for ethmoid and frontal sinus work; especially when so many influenza cases have a complicated frontal sinusitis; even more disagreeable when you get gunshot wounds of the sinuses, with retained fragments. So in reporting the following cases of gunshot wounds of the sinuses, let it be understood that in their treatment one might have done differently in their own office or hospital, and at least, could have done them with more facility.

Except those cases which are too severe to be moved from the evacuation hospitals, most of our cases arrived from two to six days after being wounded, and had from a few hours' to two days' stay in an evacuation hospital, after which a two to four day ride in a hospital train. During this time they could receive little or no surgical attention. All cases of course were infected.

The data we received with the patient was in the shape of brief notes on the field medical card; of treatment received in the evacuation or field hospital, and brief X-ray report. These cards were often illegible, through hurry, dirt and blood, but were important in showing approximately the diagnosis and what had been attempted.

In general gunshot wounds involving the sinuses are not hard to treat, unless there is great destruction of tissues necessitating plastic work, or where they are complicated with brain lesions or are connected with the orbital tissues. In the first place every one knows the tendency of the bones and mucus membranes of the nose, to knit and heal quickly. In the second place, the American soldier in France is an especially healthy and strong individual, whose wounds heal quickly. Where there is great exterior destruction necessitating future plastic work, it is of primary importance to secure drainage into the nose and as soon as possible to get the lining of the cavity either normal or filled in with tissue. In the case of connection of the sinuses to the cranial cavity, or orbital tissues, drainage must be secured and at the same time, care used not to excite the already partially or wholly walled off process to extend deeper. In fact, the treatment of these cases is just one of ordinary surgery, plus the guidance of the specialist in removing foreign bodies, cleaning up the debris, and maintaining drainage down into the nose, and controlling the exuberant granulations.

Case I. Sgt. K. 355th M. G.

Entered the hospital September 11, 1918, having been wounded on the morning of September 8th, a small piece of shrapnel having entered face 2½ cm. below the inner canthus of the right eye.

The wound was about 1 cm. by 1½ cm., infected and discharging muco-pus. Patient stated that when he blew his nose, air came through opening. Probe entered wound about 3 cm., touching rough bone most of the way.

Examination of nose shows swelling and inflammation around right middle turbinate. Septum markedly deviated to right. The following day X-ray plates showed a small foreign body in region of posterior ethmoids close to septum. Probing did not reveal presence of foreign and under fluoroscope probe could not be made to touch it.

Operation: Sub-mucus resection of septum to allow room for operating post ethmoids. The posterior tip of the right middle turbinale was removed with snare and forceps. The region of the post ethmoids was found somewhat macerated and covered with fresh granulations. The posterior ethmoid labyrinth was then opened and partially removed, after which by careful probing both under the fluoroscope, and by feeling, the foreign body was located and removed with forceps. The post ethmoids were then cleared up, and the surface sprayed with Dichloramine "T." A small loose pack saturated with D. C. T. was left in place and a similar drain placed in the external wound.

After treatment consisted of washing out the post ethmoids with borax solution through the

* Read before the Forty-eighth Annual Meeting of the Medical Society of the State of California, Santa Barbara, April 1919.

external wound, followed by D. C. T. spray through the wound and nares. Keeping down granulations; and letting the external wound fill in from the bottom. Recovery was uneventful. The external scar was practically nil.

In concluding this case I might say that I had a struggle with the plastic surgeon, who almo insisted upon going after the foreign body throu the external wound, which you can easily see would have been well nigh impossible, and would have left a large unsightly scar. He admitted his error afterwards.

Case II. Private R., G. S. W., right malar region.

This case was probably the most serious one I had to deal with.

He entered the hospital on October 15, 1918, having been wounded five days before, from a high explosive shell. One large fragment and several small ones entered the right malar region; the two largest ones passing inward and downward through the right antrum, through the nasal cavity then upward and outward through the left antrum lodging under the overhanging edge of the zygomatic process of the left malar and superior maxillary bone. The explosive force of the large fragment, traveling at such velocity, must have been very great; for both antra were literally macerated, as well as the septum and two inferior turbinates and the floor of the right orbit.

Examination showed both cheeks puffy and oedematous; an opening 2 by 1½ cm. over external surface of right malar bone. Probe passed downward through right antrum into nose. Both lower turbinates were macerated and large hole found in septum. A great deal of discharge from both nares and external wound, many loose bone fragments throughout course of channel, conjunctiva of both eyes very oedematous, and ecchymotic spots in right bulbar conjunctiva. Both pupils fully dilated and fixed as though with atropin. No light perception in right, and light perception only in left. Both discs swollen, right more than left, with hemorrhages in retina of the eyes.

X-ray examination showed several foreign bodies near site of external wound, and one large and one small one in the left malar region as mentioned.

Operation: Under general anaesthesia.

Incision below ant. root of left zygema about 1 cm. and foreign body located with needle probe and carefully dissected out. Opening into left antrum determined and enlarged. Left lower turbinate trimmed off and opening into antrum enlarged below. The right lower turbinate was adherent to septum and partly blockaded the opening in septum; was left in place.

Dakin's tubes were inserted from both right and left external wounds.

After treatment. For the first three days Dakin's solution was used in the usual manner, through both wounds, washing out through external nares. After that borax solution was substituted, the purulent discharge having ceased. For two or more weeks there was a good deal of mucous discharge, with frequent fragments of bone coming away, after which both wounds began to fill in. The oedema of the face and eyes disappeared quite rapidly after the operation. The eyes were protected from the light, as the pupils remained fixed and dilated. The optic discs swelling receded. The left eye improved from light perception to 20/100 when he was evacuated to the U. S. two months later. The right eye still remained blind. With the formation of scar tissue also, the right socket and bulb began to be retracted and there was no muscular motion of the muscles of the right eye ball. The left eye muscles were weak and limited in action. A month after the original operation I freed the m. m. of the right turbinate from the septum, leaving as much as possible on the septum which almost completely covered the perforation.

When evacuated two months after receiving, both wounds were well filled in, drainage being entirely through the nose on the left side, and mostly through the nose on the right. The right external wound, however, was still filling in.

This case as you can see was a very serious one, both from the extensive destruction and from the involvement of both eyes. It was the eyesight, which was the primary thing to save or improve, once the man was out of danger from shock and infection.

What the final outcome will be I do not know, but I did feel well satisfied with him when he left. Owing to the fact that the injury entered the bone without destroying many of the soft parts of the cheek, I believe he will be free from any disfiguring scars, from contraction; however, the right eye will continue to retract down and in for some time. That will be in the hands of the reconstruction surgeon.

Case III. Private T.

First seen, October 19, 1918, having received multiple shrapnel wounds on October 10th. All wounds had cleared up, except the one he was sent to nose clinic for at this time.

Examination showed triangular 1 by 1½ cm. opening at inner border of left eyebrow, which was discharging muco purulent material. Opening passed back into the ethmoid labyrinth and upward into frontal sinus. With porcelain pointed probe I could not detect the foreign body. Probe from below in ethmoids could be touched by probe through wound. X-ray located the foreign body in the ethmoid mass. Repeated attempts to locate foreign body with probes and remove through wound opening or through nares, failed even with fluoroscope, because instruments for operating ethmoids were unobtainable. The case was treated by irrigating through opening and spraying with D. C. T. after enlarging opening into nose in region of frontal duct. The discharge disappeared rapidly and the external wound began to fill in. I kept this open with difficulty for some time (two weeks) when I let it close. There was no inflammation or discharge in the nose from the region of the ethmoid or frontal. The scar was invisible in the hair line.

This patient was under observation for nearly two months after the armistice, reporting twice a week from the convalescent camp where he was being held; and there was no recurrence of inflammation, so I let the foreign body be, even after I received the proper instruments to work with. I explained to him his condition, told him to remember it if he ever had trouble afterwards.

Case IV. Corporal D.

Shrapnel through left side of nose just anterior to inner canthus of left eye. Report of operation in evacuation hospital, where a counter-opening in corresponding position right side made but foreign body not found. A through and through gauze drain had been inserted.

X-Ray examination showed foreign body about one cm. below inner ⅓ of right orbit in maxillary bone, but near surface.

Under local anaesthetic the foreign body was located through incision on right side, and was dissected and removed. Foreign body 1 by 1 by ¾ cm. ragged piece of metal. A large piece of frontal process of maxillary bone was found fractured and loose, but was left in place for contour. A small opening into right antrum was found after foreign body removed. Blood and mucopurulent material washed out of antrum.

Both right and left openings were sprayed with D. C. T., and then a gauze drain saturated with D. C. T. inserted in each side, after placing rubber tissue between septum and wall of nose, inside.

The after treatment consisted in letting the wounds of both sides fill in, keeping down granulation between the septum and lateral wall of the nose, and washing out the right antrum by means of a probe puncture. The antrum cleared up in a few days. Recovery was uneventful; the two small scars left were scarcely noticeable, appearing like the marks of "pince-nez" glasses. The loose piece of frontal process of the right maxillary was retained and healed in place leaving a scarcely palpable bump.

In concluding this paper I wish to mention several points that have impressed me in regard to sinus work of this nature.

In the first place the matter of waiting. In several cases where sinuses were involved in a wound the tendency was to operate, clean it up, trim it, do something. We found that more often than not, irrigating with borax solution or Dakin's, spraying with D. C. T. and waiting a few days, the operative procedure was made much easier by the cleaner field, and less inflammatory condition of the structures. This does not in any way mean that where existing complications indicate immediate operation, that operation should be put off. Furthermore, in one case shown here, and one other case, the case healed up without its being necessary to operate, the bodies undoubtedly becoming encysted.

Another thing in these cases is the tendency to do too much, to remove too much tissue. The cases are acutely infected but the radical removal of much tissue is not necessary. This is especially true of small pieces of bone, often loose, which may be needed for contour and if left in place aid in the ultimate result. Good drainage from a sinus of this nature usually does not mean the large openings made in the case of chronic diseases.

I have spoken of Dakin's solution in connection with this work. I was afraid to use it at first, owing to its irritating effect on the mucous membranes of the nose and throat. However, we found that we could get good results in those cases when there was a good deal of macerated tissue and discharge, by using it for about two days at the start, and then, when irrigation was still necessary changing to borax solution. The infection appeared to be curtailed by this procedure. If there were any signs of irritation of the mucous membranes we stopped Dakin's immediately. This irritation usually appeared on the third or fourth day, and was manifest by a grayish haziness of the surface, with a suggestion of red, deeper than normal, underneath.

Dichloramine T, as prepared in the weaker solutions for nose and throat, was found especially good in post-operative conditions, especially where the nose had to be packed. The gauze packing was saturated with D. C. T. and then used as a light pack. The preparation being in oil makes the pack easily removable. The beauty of the D. C. T. is that it retains its potency for many hours longer than Dakin's, and is less irritating to the nose. Used as a spray on post-operative surfaces we felt that it was exceptionally effective.

The difficulty in finding foreign bodies in the nose is known to all who have had to search for a pledgelet of cotton, or some other article lost in the cavity. The locating of pieces of shrapnel is so much the harder, being sometimes in a small cell or tucked away imbedded in the wall. We found that for pieces of metal the porcelain pointed probes were a great aid. These probes give a different grating feeling when touching metal than when touching denuded bone. I mention this although well known to many.

THE EXAMINATION AND CLASSIFICATION OF AVIATORS WITH SPECIAL REFERENCE TO THE EFFECTS OF HIGH ALTITUDES.*

By J. F. GRANT, Captain M. C., U. S. A.

OUTLINE.

Part 1. Introduction (slides).
- (a) General nature of the so-called Rebreather Test (slide 1).
- (b) Origin and History.

Part 2. The Physiology of Rebreathing and Aviation.
- (a) Adaptive changes due to oxygen want.
- (b) The special problem of the Aviator.

Part 3. Blood Pressure and Pulse Rate.
- (a) Technique and relation to oxygen want.

Part 4. Reaction of the Cardio-Vascular System to low oxygen.
- (a) Cardio-Vascular compensation for oxygen want.
- (b) Failure to compensate.

* Read before the Los Angeles Medical Society, April 24, 1919.

Part 5. Psychological Tests.
(a) Purpose, technique and relation to Rebreathing test.
(b) Motor performance important, sign degree of inefficiency under oxygen want.
Part 6. Ophthalmological Tests.
(a) Nature, Purpose and Technique.
(b) Two types.
Part 7. Typical Records (slides).
Part 8. Summary.
(a) Value of the test and estimate of its relation to the future practice of medicine.

PART 2.

Physiology of Rebreathing and Aviation.

Physiological observations of men and animals living at high altitudes show that the following definite changes under reduced oxygen take place in the organism, namely:

1. An increase in the percentage and total amount of haæmoglobin in the blood of the body and a redistribution of the red corpuscles in the body.

2. A fall in the lung alveolar carbon dioxide pressure and a corresponding rise in the alveolar oxygen pressure.

3. A rise in the arterial blood oxygen pressure.

4. An increase in the rate of blood flow.

These adaptive changes clearly assure a more adequate supply of oxygen to the tissues. The order in which these adaptive reactions occur in men who passively ascend mountains by railway trains or automobiles are, first, the increase in breathing, and then, more slowly and progressively, the changes in blood and blood flow. The adaptive changes take place more rapidly during the first two or three days spent at high altitudes, but are not completed for a period of several weeks. The aviator does not remain at high altitudes long enough to benefit from slow adaptive physiological changes, therefore, his body must be capable of making rapid compensatory changes which will provide the oxygen needed by the tissues. He must be able to bear abrupt and great changes in atmospheric pressure. Without the occurrence of some one or more of these adaptive physiological responses to provide for his oxygen needs as he ascends, his life and aeroplane become more and more jeopardized as he continues his ascent. That the body can and does respond to the demands for oxygen during rapid ascents has been proven by laboratory experiments and the experience of aviators and bolloonists The physiological responses that are definite are, increased ventilation of the lungs and a more rapid blood flow. It has been clearly established that the essential cause of the adaptive changes within the body when at high altitudes is the lack of oxygen which is due to the rarefaction of air that occurs as altitude increases.

The fact that there is oxygen want at high altitudes suggested that any mechanism that would permit the breathing of a reduced amount of oxygen could be used to test the ability of men to withstand the high altitudes.

The Henderson Rebreathing Apparatus has been perfected for such tests. During the tests the subject breathes the air in the tank. He sits with a clip placed on the nose and a comfortably adjusted mouthpiece in the mouth, which is suitably connected by means of inch rubber tubing with light automatic valves. He inhales the air through the respiratory valve and exhales through the expiratory valve into a cartridge containing an absorbent for carbon dioxide, namely, sodium hydroxide in cake form. The exhaled air is thus freed from carbon dioxide as it is returned to the tank. A spirometer compensates for changes in volume and writes a record of the respiration upon the revolving drum of a kymograph. By this arrangement the subject continues to rebreathe the air in the tank, from which he gradually absorbs oxygen. As the percentage of oxygen decreases, the subject, in effect physiologically, is slowly ascending to higher altitudes. The volume of the air rebreathed is sufficient to require between 25 and 30 minutes to lower the amount of oxygen to 8 or 7 per cent., which is equivalent to altitudes of 25,000 to 28,000 feet.

Throughout the rebreathing experiments physiological, psychological, ophthalmological and clinical observations are made on the subject of the test. By the physiologist, the rate and per minute volume of respiration (by means of the Larsen recorder), pulse frequency, systolic and diastolic arterial pressures are studied for each candidate tested, and have been found to give valuable information as to when he first responds to the reduction in oxygen and as to the efficiency of his compensatory reactions. Some men are sensitive to oxygen want and compensate in their breathing and the circulation of the blood so that they endure as low as 6% oxygen, the air at the beginning of the test being room air and containing 21% oxygen. Others fail to compensate in one or both of these mechanisms or compensate inadequately and therefore cannot endure so low an oxygen per cent.

PART 3.

All gradations between failure to compensate and adequate compensation down to 6% of oxygen have been found among the men examined under the low oxygen of the rebreathing tests. From the data obtained during the rebreathing test, it becomes possible to determine both the general condition of the subject and his circulatory response to low oxygen percentage. The systolic and diastolic blood pressures are taken by means of a Tycos Sphygmamonometer and sleeved Bowle Stethoscope, the stethoscope being placed over the brachial artery above the elbow of the left arm. The diastolic reading is made at the transition point from the clear, thumping sounds in the third stage to the fourth stage of dulled muffled sounds. The preliminary examination blood pressure and pulse rate readings are determined: (1) After reclining five minutes, (2) on standing, (3) after standard exercise, and (4) two minutes after exercise. The standard exercise consists of placing the right foot on a chair and raising to the standing position on the chair five times. Failure of the systolic blood pressure and the pulse rate to increase upon standing and after exercise usually indicates staleness. Aviators with a systolic blood pressure of 138 or above upon standing or two minutes after the exer-

cise have the readings taken on at least two different days before they are given the rebreathing test, as such blood pressure makes altitude in excess of 8000 feet unsafe. Every advantage is given the flier so that he may be his normal self physically when he takes the rebreathing test. Immediately before the test three so-called normal blood pressure and pulse rate readings are taken while the subject sits at the machine with nose clip and mouthpiece in place. After rebreathing is begun the pulse rate is counted every minute and the arterial pressures determined every other minute until the 18th minute, after which they are taken every minute until the end of the experiment. The pulse rate is counted in the interval between 20 and 40 seconds and recorded as taken on the half minute. The systolic and diastolic pressures are determined in the interval between 45 and 15 seconds and recorded as having been taken on the minute. When the "Run" is completed or terminated three more readings are taken as soon as possible to determine the time required for recovery.

Part 4.

Reaction of the Cardio-Vascular System to Low Oxygen.

In compensating for o^2 deficiency we notice, first: as soon as the blood begins to carry less oxygen, an increase of respiration is noticed; second: there is an increase of blood flow which is accomplished either by a peripheral relaxation of the arterioles to allow more blood to pass, hence there must be an increase in the amount of blood coming from the heart; the latter is accomplished either by an increase in pulse rate or by an increased volume-output beat. When circumstances calling for a compensation involving heart strain arise, certain hearts will respond with necessary effort even to their own detriemnt, while others will give up the task at once and allow physical inefficiency to result. The condition is partly one of heart muscle and general physical tone, and partly of the quickness and efficiency of the nervous reaction which govern the vital functions. The same principle applies to the whole body—to the personality as well as the heart alone. At one extreme is the OPTIMUM TYPE OF REACTION: Those who compensate fully to very great altitudes, retaining their efficiency and yet doing this in so accurate and economical a fashion that there is little or no evidence of circulatory strain. When the break comes (above 25,000 feet in low pressure tank, at about 5.5 per cent. of o^2 on the rebreather) it comes with great suddenness; from almost full efficiency there is a quick lapse into unconsciousness, but still no circulatory collapse. There is no loss of general muscular tone; the subject sits with eyes open, stylus held firmly in hand, color full, though of course cyanotic; pulse full and regular, systolic and diastolic pressure maintained. Recovery is almost instantaneous and is complete. The subject usually refuses to believe that he has not been conscious and efficient throughout. We must attribute this unconsciousness to the direct action of low oxygen on cortical centers while the circulation is still in order. Quite different is the picture when circulatory failure has occurred; cardiac dilation, sudden collapse of muscular tone, ashy pallor, cold sweat, complete loss of muscular tone so that the subject always falls from the chair. Recovery is slow and unsatisfactory. It is often an hour before the man is himself again. Circulatory collapse may be seen at any part of that test, depending on the amount of strain preceding it, and usually comes most unexpectedly. The increase in the frequency of the pulse rate for the majority of men who have acted well has varied between 20 and 40 per minute at almost 8 per cent. of oxygen; an acceleration of more than 50 is regarded as excessive.

The degree of acceleration is ordinarily slight until the oxygen has fallen to between 13 and 9 per cent. From these on down the acceleration occurs rapidly. The rise in systolic pressure usually is not more than 20 mm.; a greater rise is considered excessive. The diastolic pressure fall, when it occurs, is either a slow controlled drop or of the rapid fainting type which is often spoken of as a break in the circulation.

Part 5.

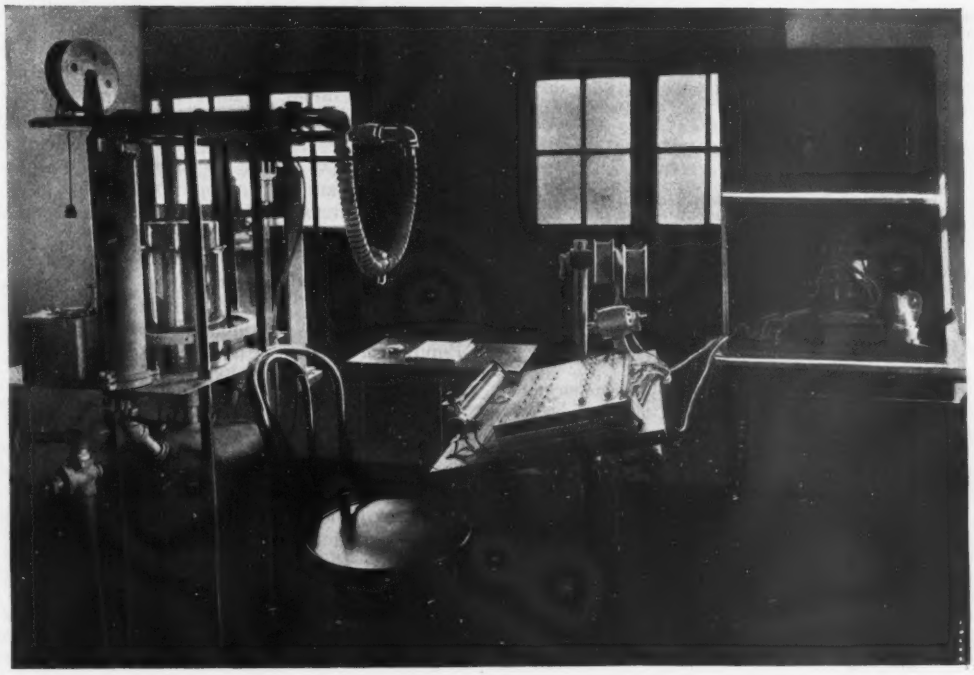
Psychological Tests.

The purpose of the psychological tests is to reveal the reactor's mental condition from minute to minute as he ascends from the ground to his maximum altitude. This is interpreted in terms of his attention and his motor reactions. Three tasks are assigned to him. Two rows of electric lights on the table before him, flash at intervals of four seconds, to each one of which he responds by touching a brass contact button with an electric stylus held in his right hand, lighting a green light if properly done, and a red one if he misses. With the same hand he also controls an ammeter, keeping the pointer at a designated mark. As his third task he is required to control the speed of a light fan motor by means of a pedal operated by his foot. The frequency of the reactions are controlled by the psychologist (who sits directly in front of the reactor) and are so adjusted as to keep the reactor busy without hurrying him. This serves to keep his mind off his breathing and off himself, and reveals his attention and motor capacities from minute to minute of the test. It also tends to lower the emotional disturbances caused in some cases by fear of the apparatus, fear of fainting, fear of making a poor run or whatnot.

When a run begins the reactor establishes his own norms—that is, during the first 3 to 7 minutes on the machine, his natural and characteristic methods of responding under normal oxygen supply are noted and recorded. The cases thus far run have shown marked individual differences; some men are normally accurate, steady, composed, alert, rapid and active; others are inaccurate, excitable, jerky, slow in mental or motor reaction. A record is made of his responses for each minute. As the run progresses it is the special duty of the psychologist to detect and record the point at which the reactor's normal responses become impaired because of oxygen want. There is considerable variation among various aviators, but statistics compiled from a large number of records show that the first effects appear near the 15th minute, and the total

motor or attention inefficiency near the 23rd minute when breathing 52 liters of air. In occasional cases a reactor may show practically no discernable lowering of efficiency whatsoever up to the very point of collapse. Such cases may faint before they can be taken out of the chair unless observed very closely.

In the psychological record the reactor's responses are, for convenience, classified under two heads, namely, attention responses and motor responses. In the case of some aviators the motor control breaks several minutes before the control of the attention. In others the opposite is true, and in some the break of both comes at once. As soon as either attention or motor responses deteriorate to a certain number of errors per minute or frac-



tion thereof, he is taken off the machine by the psychologist.

The three tasks of the test correspond somewhat to those incident to driving an airship, but are not exact duplicates. An exact duplication of the tasks of practice of the men tested, would vitiate the results. By choosing wholly new tasks the practice effects from driving a ship is eliminated.

Psychological Instructions for the Test.

READ CAREFULLY.

You have three things to do:

1. **Lights.**

When a light flashes, touch with the stylus the top of the corresponding button, before the light goes out. Do not touch the washer.

2. **Ammeter.**

Watch the ammeter and by adjusting the slide of the rheostat, using the right hand, and keep the ammeter at the designated mark.

3. **Motor.**

Keep the motor at a low speed by maintaining the proper positions of the pedal. When the motor speeds up, push the pedal from whichever position in which it is (heel down or toe down) into the opposite and leave it in the new position until the speed again increases.

NOTES.

(a) The lights are of the first importance—i. e., if a light appears when you are reacting (or about to react) to the ammeter hand, react to the lights first then go back to the rheostat.

(b) Operate the pedal when the motor speeds up regardless of what is being done with the hand.

(c) When you touch with the stylus a contact button corresponding to a light, the movement of the hand and arm should be a free one (neither arm nor hand should touch table, rheostat or board). The hand may at other times rest on the slide of the rheostat.

(d) Do your work with ACCURACY, NEATNESS, PROMPTNESS, and do not bang, slam or jab.

Selecting target in wrong column.

Wrong direction on the dial.

Wrong shift of the pedal.

Two of the symptoms and repeatedly.
In certain cases, exaggeration of one.

Two of the symptoms.
In certain cases, exaggeration of one.

Inefficiency. Inability to control any of the three tasks. The reactor sometimes stares at the lights without making any attempt to touch the target; or merely irrelevant touches, completely disregarding L and N. Sometimes he develops severe tremors or jerks which make it impossible to work. Occasionally a reactor develops unique symptoms at this point.

Breakdown. Reactor ceases to work and begins to collapse at this point. This comes very soon after O, but is qualitatively a much more serious condition.

Reactor "taken off." Air or oxygen given him.

ADDITIONAL SYMPTOMS.

Tremor of the hand.

Jerkiness of the hand.

Swaying or droopiness of the head.

Taps button more than once.

Rests hand on fingers while touching button.

Keeps stylus on button after making touch.

Normally the work proceeds until definite inefficiency is reached. At this the psychologist must signal sharply to the clinical observer that the limit is reached, in order that the reactor may immediately be given air. A delay of a minute beyond this point may result in the collapse of the reactor.

SYMBOLS AND THEIR SIGNIFICANCE.

First significant effect on voluntary co-ordination.

Fumbling; clumsy; inaccuracy in touching targets.

Groping; approaching target with corrective movements.

Increased effort or force in applying stylus to targets.

Decreased effort or force in applying stylus to targets.

Impulsive or uncontrolled movements.

Slowing of reactive movements.

Speeding of reactive movements.

First significant effects on attention.

Distraction from lights; neglects lights.

Neglects lights for voltmeter.

Reactor delays initiating stylus movements so long that he fails to light check lamp.

Reactor delays so long that he touches the target after light has gone out.

Reactor starts movement after light has gone out.

Reactor makes no attempt to initiate light reaction.

Distraction from the dial; neglects to note and adjust the position of the index hand.

Distraction from the noise; neglects to control the speed of the motor.

Confusion between rows of lamps; but finally touches the right target.

Selecting target in wrong row.

Ophthalmological Tests.

The preliminary examination of the applicant's eyes is a check upon those who have given the 609 form of examination, and as there are about sixty examining boards scattered over the country, many applicants have been qualified who should have been turned down. This occurs sometimes through carelessness or friendship for the applicant and occasionally to the fact that the applicant deliberately deceives the examiner by his answers when the muscle tests are made.

The requirements of a flier from an ophthalmological standpoint are as follows:

VISION. 20/20 or better in both eyes tested separately. Normal Color, Field and Stereoscopic Sense. Muscle imbalance must not be over 2° Hyperphoria, 4° Exophoria, and 6° Esophoria. Pupillary reaction—direct and consensual. Accomodation—normal. All men disqualified who have any inter-ocular disease even if vision is 20/20. Near point of accommodation as to age, by a Prince Rule, near point of convergence in like manner. The latter is an objective test, as you can see the eye slip out when the black spot doubles. Field of Binocular Fixation is tested by a hand Perimeter as it is important that the aviator be able to turn the eyes as far as possible in various directions, without turning his head and without seeing double. If a man has contracted binocular fixation, it certainly would impair his efficiency, whether observing, fighting

or flying. Prism duction power is taken in all cases of muscle unbalance. The preliminary examination is always carefully done. After doing this work for about one year, my personal experience has been that there are only two classes of cases disqualified by the rebreathing test. i. e. Where the applicant has 2° Hyperphoria with 3 or 4° Exophoria. 2. Convergent insufficiency with divergent excess that is abduction of 8 or 9° with abduction of 7 or 8° where we know the abduction of a ratio of 3-1 of abduction. A fall of 20 mm. in Accommodation or Convergence does not warrant disqualification but a fall or 30 or 40 does, as the applicant would have diplopia at high altitudes.

No. 155—H. F. D. K. Cadet; Age 25 years 10 months.

This is almost a record run for low percentage reached, and preservation of efficiency practically unimpaired until the very last. Pulse rather high from the start as is often the case in subjects who compensate particularly well, and both pulse and systolic pressure show some psychic influence at the start. During the course of the test there is a typical moderate rise in the pulse and systolic pressure and a gradual tendency downward of the diastolic pressure. Respiration shows a healthy progressive increase. No suggestion of circulatory exhaustion. Rated "AA," a particularly good subject.

No. 50—E. O. T. 2nd. Lieut. Pilot; Age 31 years 8 months.

In good health but out of training, and twenty pounds overweight. This chart almost total failure to compensate. There is very little change in pulse or blood pressure, and the respiratory reaction is deficient. For this reason, there is an early appearance of inefficiency as shown by psychological characters, and he is completely inefficient above 9°. Since there is no circulatory reaction there is no evidence of strain. Class "C" becomes inefficient at a relatively low altitude.

No. —F. S. D. Cadet; Age 25 years 5 months.

An unusually bad record. Systolic pressure very high and at the end rises to 210. Diastolic shows marked fatigue though the oxygen percentage reached is not very low. Pulse rather high at the start, shows very little acceleration later, and at 9% begins to fall rapidly. The heart sounds become roughened, suggesting a valvular lesion, which seems extremely probable from the blood pressure. Should be studied further; test should be repeated. On the showing of the chart given the rating should not be better than "D."

No. 352—R. P. E. Cadet; Age 22 years 7 months. Preliminary blood pressures: Reclining—134; Standing—142; After exercise—160; Two minutes later—134.

During the test has a high and gradually increasing systolic pressure. Diastolic comes down steeply after 20 minutes, though never out of control. Pulse and respiration normal. Marked psychical effects soon after diastolic pressure begins to fall. High blood pressure with signs of fatigue put the candidate in class "C," in spite of the fact of his reaching a fairly low percentage before the actual break.

No. 144—L. R. S. Cadet; Age 20 years 2 months. Is decidedly stale, hates to go up in the air at all. Feels tired and depressed and is discontented with the service at the present time. Certain complications at home are on his mind.

This chart is typical of a man in poor physical and mental condition. He fainted rather suddenly at about 13%. Previous to this he had shown little compensatory response. The blood pressure too low from the start, pulse rising slightly and respiration hardly at all affected. This man might be expected to faint at any time during a flight irrespective of elevation. No rating given but for the time being is unfit to fly at all. Withdrawn from flying and recommendation for furlough.

No. 110—R. S. Cadet; Age 35 years 11 months.

This chart is of a type which is not uncommon among older subjects, and must be interpreted either as decreased flexibility of the arteries or less effective vaso-motor control. It emphasizes the fact shown by experience that the best age for flying is the early twenties—a man of 36 has already begun to grow old. Preliminary blood pressures: Reclining—124; Standing—132; After exercise—142; Two minutes later—124. During the test the systolic pressure rises at the start and remains about 160. As often happens when the systolic is high, there is not a very marked rise in the pulse. There is no evidence of circulatory fatigue and he reaches low oxygen percentage with excellent command of his faculties. His present condition is first class but it is not likely that he would remain in condition long if he runs such a blood pressure when he flies. Class "B."

No. 217—D. R. Cadet; Age 20 years 6 months.

There was a roughening of the first heart sound heard before the test. No demonstrable enlargement, second sounds equal. During the test a definite systolic murmur developed and the pulmonic sound was accentuated. There was no doubt of the diagnosis of mitral insufficiency well compensated. The chart is typical of most cases of valvular lesions. The pulse is high throughout the test. The systolic pressure is high and uniform. Diastolic pressure begins to fall between 9% and 10% but is in control at all times. Respiration shows rather a marked response. Efficiency is well preserved, the psychological rate being "A." This is accomplished at the expense of marked overwork of the heart. Although this is well borne at the present time the presumption is that the subject would soon show the effects of wear, and permanent damage to the heart might easily result. Class "D."

No. 63—J. E. S. Cadet; Age 21 years 1 month.

Left hospital three days ago when he was laid up with influenza for a week. Feeling fairly well today though not up to his usual form. The first chart is typical of a man out of condition; rather high systolic pressure, psychic in both pulse and pressure, followed by a sudden faint at about 8%. In this the diastolic pressure fell to practically zero; the systolic pressure and pulse broke sharply as may be seen by the slow recovery after the experiment was terminated. He was tested again two weeks later and made a very good run with the exception of a rather high blood pressure. In this test he was not completely inefficient when taken off at 5.5%. After two weeks he was given a third test which entitles him to a "AA" rating. The systolic pressure stays below 140, there is no break in diastolic, and there is a moderate healthy rise in pulse. This case illustrates the very serious effects of temporary indisposition.

No. 123—W. B. R. Candidate; Age 23 years 2 months.

Suggestions of presystolic murmus at apex found before the test. During the test became more marked and a systolic murmur developed. Systolic pressure high from the start and steadily increased. Diastolic remained low. Note the very marked increase in respiration indicating great discomfort in breathing. Became inefficient at a rather high oxygen percentage. This chart is characteristic of the way in which many valvular heart cases respond to the test. He was not carried far enough to get the circulatory collapse which would almost certainly have happened as a result of the high blood pressure and pulse. Class "D."

Book Reviews

Anatomical Diagrams. By James M. Dunlop. 4th ed. New York: Macmillan Company. 1919.

The author gives several hundred diagrams showing the contours of the body in various postures, with the bones and muscles drawn in. The plates explain the relation between the surface and the underlying parts in a satisfactory manner. The book should be of value not only to the artist, but to surgeons, othopedists and gymnasium instructors.

L. E.

De l'Orthopedie instrumentale. By Gabriel Bidou. 132 pp. Illustrated. Paris. 1919.

This little book gives in a compass of 132 pages a view of the mechanical principles underlying the art of orthopedic brace making. It is truly French in its simplicity and clearness. The orthopedist and brace-maker will read it with interest and profit; the general practitioner will derive from it an insight into what may be demanded of a brace-maker and what may not.

L. E.

General Principles of Therapeutics. By Francis H. McCrudden, S. B., M. D. Boston: Gregory, 1917. Pp. Price $1.50.

The author's object in writing this book is given in his preface, as follows: "The need of an elementary text-book must be apparent to anyone who has attempted to give instruction in the general principles of therapeutics. There are reference books dealing with the details of therapeutics, but there is no book which establishes a point of view regarding the many and confusing details of treatment such that these details may be contemplated, not as a vast number of empirical and unrelated elements, but as mutually dependent parts of a whole; a book that treats therapeutics as a science, as a branch of applied physiology." The book outlines the best methods of treatment of diseases of the heart, the kidneys, the vessels, respiration, the blood, the gastro-intestinal tract, the general metabolism, and other chronic diseases.

The author's object, we believe, has been attained, and we can heartily recommend his book.

R. B.

Atlas of Operative Gynecology. By Barton C. Hirst. 292 pages, illustrated. Philadelphia and London: Lippincott, 1919.

The book is more than the title implies. It is a treatise on gynecological operations. The descriptions on the different operations are clear and the illustrations show te steps of each operation in its most essential stages.

The author gives in each instance the technic of the one method of operative procedure which he, in his long career as operator and teacher, has found best adapted to get the desired results. The book is splendidly gotten up; magnificent print; fine illustrations, though somewhat schematic.

To the gynecological operations proper are added caesarean section and pubiotomy, distinctly obstetrical operations. Te propriety of this addition may be questioned especially when some gynecological operations and operations often performed while doing gynecological work are omitted. Such operations as resection of the ovaries, sterilization, plastic work on the tubes, implantation of uterers in the bladder, union of severed ureters, nephrectomy, and appendectomy are omitted but should be included.

H. J. K.

Surgical Clinics of Chicago. Volume 3, Number 6. (December, 1919.) 215 pages, 63 illustrations. Published bi-monthly. Philadelphia and London: W. B. Saunders Company. 1919. Price per year, $10.

A. D. Bevan: Chronic lung abscess with fistula. X-ray diagnosis of gall-stones. Fribroma of large intestine. D. A. Orth: Management of neglected carcinoma of breast. E. A. Printy: Cholelithiasis with chronic empyema of gall-bladder. D. N. Eisendrath and Maurice L. Goodkind: Subacute pancreatitis. A. T. Ochsner: Transgastric cauterization of crater ulcer on posterior wall of stomach. A. A. Strauss: Surgical treatment of gastric ulcer with new method of pyloroplasty. Excision of duodenal ulcer. Carl Beck: Old sinus from hip disease treated by skin sliding. Diverticulum of urinary bladder in inguinal hernia. Gangrenous hernia of bladder and intestine. J. R. Harger: Acute hyperplasia of thyroid with dyspnea. Kellogg Speed: Elephantiasis nostras. V. C. David: Incontinence of rectal sphincter. Rectovaginal fistula. Dr. Gatewood: Lacerated wound of buttock. Golder McWhorter: Osteomyelitis with variation in growth of femur following separation of distal epiphysis. B. F. Davis: Fracture dislocation of astragalus. W. T. Harsha: Acromegaly. T. J. Watkins: Amenorrhea and sterility due to functional endocrine disturbances. E. L. Moorhead: Multiple uterine fibroids. Epigastric hernia. Gunshot wound of buttock. W. J. Woolston and W. B. White: Report of 1000 patients operated on for tubal infection. Gustav Kolischer and J. S. Eisendraedt: Lesions of female urethra. H. L. Kretschmer: Diagnosis of ureteral calculi.

Surgical Clinics of Chicago. Volume 3. Number 5 (October, 1919). Octavo 258 pp. Illustrated. Philadelphia and London: W. B. Saunders Company. 1919. Price, per year, $10.

D. N. Eisendrath: Congenital cystic disease of kidney. Consideration of tumors of kidney in general. A. D. Bevan: Abdominal tumors. Abscess of pancreas. Case of ulcerating carcinoma of breast. A. D. Bevan and J. C. Gill: Ossifying enchondroma of brain. Kellogg Speed: Duodenal ulcer. A. J. Ochsner: Technic of partial gastrectomy. Gastrostomy for carcinoma of cardia and lower esophagus. H. A. Potts: Non-union or fibrous union of fracture of jaw. Malunion after fracture of jaw. Correction of deformity following loss of upper lip and anterior portion of upper jaw. Plastic operation restoring the lower eyelid, making the insertion of an artificial eye possible. Apparatus for making tracings of X-Ray plates. A. H. Montgomery: Gunshot fractures of innominate bone. Paul Oliver: Crutch palsy. Fracture of sixth cervical vertebra. Forward dislocation of atlas on axis. Silent caries of spine. Dr. Gatewood: Dislocation of outer end of clavicle. Enchondroma of the hand. E. L. Moorhead: Exophthalmic goitre. Removal of right lobe and isthmus. Fracture of femur in boy five years of age. Open treatment following failure of non-operative methods. C. L. McWhorter: Acute obstructive appendicitis. T. J. Watkins: High Rectocele. H. L. Kretschmer: Carcinoma of bladder. Diagnosis and treatment of bladder stone—Litholapaxy. R. H. Herbst: Carcinoma of prostate. Nephrolithiasis. Hypertrophy of prostate gland in a case of probable Hodgkin's disease. Carey Culbertson: Ovarian cyst and chromic pyosalpinx. E. L. Cornell: Demonstration of obstetric cases with discussion of points in technic. B. F. Davis: Fracture of the os calcis.

Industrial Medicine and Surgery. By Harry E. Mock, M. D., F. A. C. S., Assistant Professor of Industrial Medicine and Surgery at Rush Medical College. Octavo volume of 846 pages with 210 illustrations. Philadelphia and London: W. B. Saunders Company. 1919. Cloth, $10.00 net.

It is impossible to do justice to Mock's excellent and most timely book within the limits of a short review. His work proves him eminently fit for the task he set for himself when he undertook to crystallize in a single volume the enormous mass of scattered facts and data that recent years have brought forth in industrial medicine and surgery.

The book shows the results of painstaking labor in collecting and digesting widely dispersed statistics and experiences. More than this—it gives the author's personal opinions gotten from years of energetic and admirably systematized work in teaching and practicing industrial medicine.

It is impossible to give an adequate oversight over the contents of this volume. It gives in detail plans and schemes of organization and systematization of industrial welfare in its medical, social, economic and financial aspects. It considers the hygiene, medical supervision and care and the social welfare of the healthy employee as well as provisions for treatment of the sick one. It contains admirable chapters on the most important disabilities—tuberculosis, hernia, the neuroses, etc. It makes a plea for the examination and re-examination of every employee, for group study in industrial medicine, and for a well-trained part-time staff, rather than the old job-holding "Company Doctor." It gives detailed plans for the carrying out of the measures for which it pleads.

The book has sown a virgin field. It will live through many editions and see many changes as Mock's teachings bear fruit.

It can be heartily recommended to surgeons of large institutions and industries, and no less to employers interested in health and welfare of their labor. L. E.

Human Infection Carriers. By Charles E. Simon. 250 pages. Philadelphia and New York: Lea & Febiger. 1919. Price, $2.25.

In preventive medicine, the carrier problem has the first claims on recognition, as it is the latent or persistent human carrier who is immediately responsible for the recrudescence of infection, whether in endemic or explosive form. Our knowledge of the carrier status is primarily the result of bacteriological research and as a rule only through the application of laboratory methods the carriers as seeds for further infection and epidemic are detected and brought under proper control. The book of Simon is written from the standpoint of the laboratory worker, detecting convalescent or contact carriers, but throughout the text attention is directed to the class of carriers which are either in fair health or not obviously diseased. The importance of these carriers should be proclaimed with unremitting insistence, because they are not sufficiently unwell to be restricted in their habits and occupations and are apt to pass unheeded unless subjected to bacteriological investigations. The treatise enhances a similar publication of Ledingham and Arkwright (The carrier problem in infectious diseases. Longman & Co.) which appeared in 1912, but it also summarizes many recent contributions to the problem of the pneumococcus and influenza carrier, and can therefore be with benefit consulted by the general practitioner and health officer. The diseases treated from the carrier point of view are cholera, diphtheria, plague, typhoid and paratyphoid fever, epidemic meningitis, bacillary dysentery, acute poliomyelitis, pneumococcus pneumonia, streptococcus infections and influenza. Each chapter contains a fairly well selected bibliography. Many valuable observations made during the war on dysentery carriers by Fletscher, on meningococcus carriers by Gordon, and the broad field of protozoan and insect carriers deserve consideration in the next editions. An analysis of the clinical and surgical aspect of the various types of carriers would undoubtedly be exceedingly valuable.

The Appendix, dealing with the important state laws, municipal ordinances, federal inter-state regulations applicable to the carrier problem, demonstrate how inadequately many states are provided with a public health machinery to protect their communities from the ever-growing menace of carriers. K. F. M.

Correspondence

The following letter is copied from the *Pacific Printer and Publisher* and speaks for itself, as did the editorial to which it refers:

KICKERS AND WORKERS

San Francisco, February 4, 1919.

Editor, The Pacific Printer:—

The following clipping culled from a recent number of the *California State Medical Journal* is so good, so true, and so apropos of conditions existing in our own Printers Board of Trade (among a small but noisy minority) that I think it is well worth reproducing in *The Pacific Printer*.

If you can find space for it, I urge you to run it, and ask the reader to insert "Printers Board of Trade" wherever Medical Society appears in the article. Mayhap it will tend to awaken some of our "chronic kickers" to a realization of the fact that the man who serves an organization in an official capacity is himself making a great sacrifice—for the benefit of "the other fellow."

Cordially yours,
TWIN PEAKS PRINTER.

County Societies

ALAMEDA COUNTY

The regular monthly meeting of the staff of the Samuel Merritt Hospital was held February 2, 1920.

Dr. A. C. Siefert read a paper entitled "Roentgen Diagnosis of Diseases of the Lungs and Pleura." Some instructive plates were also exhibited.

Dr. Harry Alderson of Stanford University discussed diseases of the skin.

The regular monthly meeting of the Alameda County Medical Society was held at the Public Health Center January 19. The evening's program was devoted to Pediatrics.

Dr. W. A. Wood read a paper on "The Nervous Child."

Dr. Ethel Walker read a paper on "Experiences in Children's Work in Great Britain During the War."

A paper on "Infantile Scurvy" was presented by Dr. Clifford D. Sweet.

The Alameda County Society has subscribed to life membership in the Lane Library.

Personals

Dr. Alvin Powell was married to Miss Josephine Miller January 16, 1920.

The following physicians have been or are now suffering from an attack of influenza: Dr. W. A. Clark, Dr. H. Bell, Dr. E. G. Simons, Dr. H. Koford.

FRESNO COUNTY

The January meeting of the Fresno County Medical Society was held in the University Club rooms in Fresno City January 6.

The attendance was large, in as much as several matters of importance were to come before the society. The first being the election of officers and the following members were elected for the ensuing year: President, J. H. Pettis; First Vice-President, Guy Manson; Second Vice-President, Geo. H. Sciaroni; Secretary, C. O. Mitchell; Assistant Secretary, G. W. Walker; Treasurer, Union National Bank. L. R. Wilson was elected the new member of the board of governors. J. R. Walker was chosen as delegate to the State Convention. K. Stanniford was elected alternate delegate.

The recently elected new members are L. F. Luckie, T. F. Bell, F. B. Sheldon, D. Divanovich.

Dr. G. H. Hare then read a report of the Library committee and the amount of work in the way of new volumes added and journals bound was a revelation to the society. This work is to be continued by Dr. W. W. Cross.

The newly elected president then took the chair and introduced the speaker of the evening, Dr. John F. McKenna, Veterinarian, who delivered a very interesting paper on Rabies. The discussion called forth was lively.

The last and most interesting feature of the program was that prepared for Dr. Geo. H. Aiken. The stage had been nicely prepared and on the arrival of Dr. Aiken one of his old friends and coworkers arose and in eloquent language brought forth charges that were startling to the members who did not know the man about whom they were said. As Dr. Aiken, who has grown gray for these many years in the service of his fellow man, arose a bit staggered at the audacity of the proceedings, to defend himself, he was presented with a beautiful watch, which was the Society's way of expressing the honor and esteem in which the oldest, best loved and most honored member is held by his brother practitioners.

Dr. Aiken expressed his thanks to the society, saying that this his 75th birthday would be the most memorable of his life.

Dr. Geo. H. Sciaroni has left for Pittsburgh, Pa., where he is to study Radium Emanations. He will also visit Baltimore and New York.

Dr. Guy Manson has gone to Johns Hopkins for a six months' post graduate course in surgery.

Dr. Madden of Sanger has gone to Philadelphia to study eye under DeSweinitz. Dr. Madden will locate in Fresno upon his return.

A special meeting of the Fresno County Medical Society was held at the University Club Rooms Sunday evening, January 25, for the purpose of presenting to the public the prevalence, extent, and necessary measures to combat the present epidemic of acute respiratory infections.

At this meeting, the resolutions, following, were adopted by the Society and the instructions were given that the same should be transmitted to the Fresno City Board of Health for conveyance by them to the public through the agency of the press.

Whereas, An epidemic of acute respiratory infections is now existing in Fresno and vicinity; now, therefore, be it resolved:

1. As regards wearing the proper face masks, this committee can only recommend its enforcement;
2. Some measure be found making it compulsory for each individual physician to enforce isolation and quarantine regulations immediately after determining upon a diagnosis of influenza or acute respiratory infection; and to promptly report the case and his action taken to the proper Health Authorities;
3. All schools, theaters, churches, and other places of public gathering be closed;
4. All matters pertaining to the handling of foodstuffs for use in public places be made the matter of special investigation by a committee to be appointed by the Board of Health for specific action toward betterment;
5. The necessity for the establishment of hospital facilities be urged upon the proper administrative authorities for immediate provision;
6. The public be fully informed as to the existing conditions, the seriousness of these illnesses, and the necessity for hearty co-operation.

The discussion following the presentation of the above resolutions was most heated. A member of the City Board of Health went so far as to say that the present situation was due to cosmic disturbances and therefore all suggestions useless.

LOS ANGELES COUNTY

The Los Angeles County Medical Association Meeting, January 8, 1920, Friday Morning Club.

Dr. Rae Smith, the president, opened the meeting at the usual time.

Dr. Oscar Reiss presented the subject of "Infant Welfare Work in Los Angeles," describing in detail the organization of the welfare department, and presented a detailed study of 602 infants, particularly as to their feeding history.

A graphic chart pointed out in a clear manner the comparative monthly gain in weight, the difference in morbidity and mortality figures of the bottle fed infant, the infant breast fed for less than three months, and the infant breast fed for a longer period than three months. The chief conclusions were:

1. The infant breast fed three months or longer, not only weighs more than any other class of infant at the end of the first year, but has had a much lower morbidity incidence and mortality rate.
2. The average physician does not seem to appreciate the fact that breast milk is the sole adequate food of the infant and that no other food should be substituted until every effort has been made to maintain maternal nursing.
3. The average physician is too ready to substitute an artificial food, and often the formula for which he allows the patent baby food manufacturer to furnish the mother.
4. The welfare station occupies the position of an educational center where the mothers may learn how to properly feed and care for their infants.

Dr. C. E. Carter, in his discussion, accentuated the necessity of stirring up a greater interest in breast feeding. Also pointing out the special advantages of breast milk.

Dr. A. J. Scott, Jr., reviewed the history of infant welfare work in Los Angeles, pointing out the great strides made during the past year, with special reference to the fact that the welfare stations were being used for teaching purposes.

Symposium on Tubercular Preventoria.

At the meeting of the County Medical Association held January 8, symposium on Tuberculous Preventoria, the first paper was by Dr. Charles

C. Browning on "What are Tuberculous Preventoria," and he outlined briefly the origin and history of this type of institution and how the name was originated by Dr. S. A. Knopf of New York City a number of years ago. He mentioned the type of Preventoria that we have in the State of California in Marin County and the work that they were doing there. He was followed by Dr. A. J. Scott, Jr., who gave an intimate account of "Farmingdale, N. J., Preventorium." The location of the institution on 200 acres of beautiful farming land, and the handling of an average of 200 children per day, the taking in of only children past one year except in exceptional cases where the infant under one year was not tuberculous. The pre-requisites for entrance being, First, a case of tuberculosis in the famly; second, unhygienic family surroundings; third, a case of incipient tuberculosis; fourth, a positive Von Pirquet.

He was followed by Dr. Marcia Patrick, who described the preventorium camps which for the last three summers have been conducted for anemic and tuberculous children in Los Angeles and its vicinity. The discussion was opened by Dr. W. Jarvis Barlow who emphasized the need for more of such institutions in the state, followed by Dr. Montague Cleeves who spoke of the work that was being done in the city schools of Los Angeles for the prevention of postural deformities. Dr. Pomeroy, County Health Officer, spoke of the need of these institutions in the county in the form of local units.

The Los Angeles County Medical Association meeting of January 15 took place in the Friday Morning Club hall at 8 p. m.

In the absence of the president, Dr. Rae Smith, Dr. John V. Barrow, the vice-president, presided.

The first subject was: "Differential Diagnosis of Hyperthyroidism," by E. H. Schneider, M. D.

The author mentions the frequent occurrence of goiter with or without symptoms of hyperthyroidism, in conjunction with other diseases.

Hyperthyroidism most commonly confused with neurasthenia, neuro-circulatory asthenia, and a toxemia, especially tuberculosis.

Kendall's thyroxin has demonstrated that hyperthyroidism is the clinical syndrome resulting from excessive metabolism.

Estimation of the patient's basal metabolic rate is of greatest importance in diagnosis as well as prognosis.

He reports a case of pulmonary tuberculosis that had been diagnosed hyperthyroidism; operated upon by another surgeon and when the patient failed to be relieved, the attending physician was contemplating the removal of more gland. Diagnosis based upon the presence of nervousness, tachycardia and tremor are not sufficient.

Many patients with a history of myocarditis coming on after the 35th year, have chronic hyperthyroidism due to an adenomatous goiter.

Neurasthenic patients frequently complain of pressure in the throat and must be carefully differentiated from hyperthroidism, particularly when a small nontoxic goiter is present.

A differential blood count, the blood sugar test and the injection of epinephrin are also aids in the differential diagnosis of hyperthroidism.

Discussions by Drs. A. B. Cooke, R. Cummins, C. P. Thomas, R. B. Hill, E. C. Moore, Chas. Lockwood, B. Oettinger.

Concerning the Wassermann Reaction as the Therapeutic Index for Syphilis.
DR. BERNARD OETTINGER

This reaction was regarded solely diagnostic in character by its discoverers, Wassermann, Neisser and Bruch. Nevertheless, beginning with the time that Plaut made note that antiluetic treatment frequently changed a positive to a negative phase, a dictum has been evolved in the profession that herein lies the therapeutic index for syphilis. Unprejudiced reading of the literature shows this tradition based upon a postulate only. This is especially true of late syphilis data. We know that in the socalled quarternary stage (paresis, tabes dorsalis) a positive reaction is practically unchangeable in the former, that in tertiary syphilis the Wassermann reaction may remain positive despite sustained treatment, that the reaction becoming negative may later again show positive, that a seemingly obstinate positive after prolonged treatment may later be replaced by a negative reaction without further treatment, that a negative may so remain or become positive after treatment, and finally that an individual with no symptoms may experience dire effects from vigorous antisyphilitic treatment instituted solely upon the basis of a positive reading (gangrene requiring amputation, fatal exfoliative dermatitis). It is more just to the syphilitic patient to base treatment upon clinical aspects of his case than upon a thumb rule of Wassermann findings. This thought is emphasized by the fact that meningovascular syphilis of the cerebrum rarely gives a positive Wassermann (Head and Fearnsides) so that under these circumstances in the presence of symptoms not specifically characteristic, dependence upon laboratory results may convey false security or result distinctly in a wrong therapeutic lead. In answer to the question "What would you do in the case of a clinically well patient who showed a four plus Wassermann?" Dr. Oettinger replied, "I would leave the patient alone and thus permit him to continue doing well. On the other hand clinical watchfulness in respect to symptom development remains sine qua non."

"Neurological Indications for and Against Operation for Injury of Spine and Skull."
J. T. FISHER

Among other interesting statements, Dr. Fisher said that a crushed spine opens up the question as to immediate operation. A compression fracture of the body of one or more vertebrae often follows the impact of falls on either buttocks or head, where the force is applied in the axis of the spinal column. Paralysis rarely follows from injury to the nerve structure at the point of fracture. A radiogram distinguishes them from a sprain of the back.

Injury from high velocity missles on the bones of the spine may occasion haemorrhage and softening at points far removed from point of impact. All cases of fracture dislocation or dislocation alone, if the cord has not been pinched, require simply fixation of the spine. Experience shows that it is the upper fragments of the injured spine displaced forward which crush the cord between the lowest arch of the displaced fragment and the body of the vertebra below. The X-ray shows that this forward displacement can be overcome by fixation of the spinal column in hyper-extension. Cutting down on the spine and wiring does little good when difficulties arise in maintaining extension.

When cord is crushed, operation offers no relief except where it is possible to prevent slipping of the fragments by fixation. In partial pinch of the cord, Caminectomy is of no avail. If cord has been injured and shows improvement with retrogression of power, a radiographic picture may determine compression of the cord either by a tumor or more likely a callus.

The vertebral arches may be driven down upon the cord, compressing it by bony spicules. Such cases, like a depressed fracture of the skull, demand immediate operation. Crepitus is of no

value as it is found where there is a fracture of the spinous processes only and is absent with a break of the arch.

Concussion is a functional condition producing vaso-motor disturbance and loss of function, as a blow on the chin may produce concussion without contusion. Contusion is a pathological change, such as pin-point hemorrhages so tiny that they cannot be seen. When a concussion lasts an hour, it is a more serious affair. Edema may be a feature. The general sign is a deepening unconsciousness and a rising blood pressure. An ice cap does no good, but the head should be raised. Watch optic disc for increased pressure as an indication for operation. Rigid pupils with a rising temperature signifies destruction of central tissue. Lumbar puncture only gives temporary relief for about eight hours. With fracture of the base decompressed, 70% die. The cause was not hemorrhage, shock or sepsis, but rather oedema from contusion.

Eye grounds and spinal puncture determines the finding. Give the brain an opportunity to expand itself.

Innominate Society

"Spinal Anaesthesia," Harry T. Cooke, M. D.
"Emetine in Typhoid," John V. Barrow, M. D.
"Early Medical Histories of 100 cases of Malignancy," Norman Williams, M. D.

Symposium Society

Symposium on "Disease of Thyroid"

1. Diagnosis by Dr. R. S. Cummings.
2. Pathology by Dr. Robert Hill.
3. Treatment by Dr. E. C. Moore.

Los Angeles Obstetrical Society

1. Nitrous Oxid and Oxygen Analgesia and Anesthesia in Obstetrics.—Dr. R. F. Hastreiter; by invitation.
2. Frequent Mistakes Made During the Third Stage of Labor.—Dr. D. A. Thieme.
3. Post Mortem Caesarean Section with the Report of Two Cases.—Dr. John C. Irwin.

Harbor Branch Banquet.

Dr. and Mrs. William Day Moore, Drs. Clara M. and L. L. Rinehart, Dr. and Mrs. F. W. Reynold, Dr. and Mrs. W. E. Guidinger attended the annual meeting and banquet of the Harbor Branch of the Los Angeles Medical Society, held Friday in Hotel Virginia, Long Beach.

The principal address of the evening was given by Dr. Percy of Galesburg, Ill., who chose "Medicine of the Future" as his subject. Doctors Moore and Reynolds gave short talks. Dr. Moore has been recently elected president of the Association, Dr. J. S. Gwaltney of San Pedro being the retiring vice-president. About sixty Long Beach physicians are members.

Dr. Gladys Patric now Mrs. Chahovitch.

The marriage of Dr. Gladys Patric, formerly of Los Angeles, and Milan Chahovitch, celebrated in Ochrid, Serbia, November 30, has just been announced in this city.

Mrs. Chahovitch left here two years ago for overseas, where she was placed in charge of a tubercular hospital in France. It was during her service there that she was decorated by the French government for her brave work. Then, leaving the hospital base, she volunteered in the Red Cross unit which had for its goal—Serbia.

In the meantime—Milan Chahovitch, a young Serbian, was wounded and invalided home. The young officer, who could not return to the front, was appointed secretary to the young American woman physician, whose work with the Red Cross had assumed great proportions and concurrent responsibility.

A few months later the wedding occurred and the young couple are spending their honeymoon in the region of Ochrid, but are anticipating very shortly a trip to this city, where they will be the guests of Mrs. Chahovitch's sister, Mrs. J. N. Scott of La Canada.

Mrs. Chahovitch was graduated from the College of Physicians and Surgeons in this city and had resided here for a number of years prior to obtaining her degree.

Personals.

Dr. Burns Stoddard Chaffee has opened offices in Long Beach. Practice limited to surgery. Suite 509 Marine Bank Bldg.

Dr. W. H. Mayne has returned. Practice limited to Genito-Urinary Diseases. 917 Brockman Bldg., Los Angeles.

Dr. Thomas W. O'Reilly has returned from military service and has opened his X-ray Laboratory at 305 I. N. Van Nuys Bldg., Los Angeles.

Dr. Niel C. Trew returned from foreign service and will limit practice to anesthetics. R. F. D. S. Box 186, Los Angeles.

This item of interest to medical profession of Los Angeles County appeared in the Examiner, January 20:

U. S. C. Gets Body of Scientist for Study.

In accordance with one of the strangest wills ever made in Los Angeles, the body of Dr. Frederick W. Sanders, noted scientist and writer, who died at Thermal Wednesday, was yesterday turned over to the University of California and placed in one of the anatomical departments at Sixteenth and Los Angeles streets.

By the terms of the will, which has not yet been filed, the body is placed in immediate charge of Dr. J. Walter Reeves, professor of anatomy and physiology in the university, and will be used for scientific research purposes.

Defying Quarantine.

Mr. and Mrs. Frank E. King of Linda Vista pleaded guilty in police court to violation of the city quarantine ordinance. It was alleged that, while diphtheria existed in their home and the house was placarded, Mrs. King went to Los Angeles and Mr. King left the premises every day. They were given sentences of ten days each in jail, which were suspended with strict warning regarding the future.

Miscellaneous.

Salvage Department for Hospital of Children—712 Maple Ave., Phone 61203, will receive anything of no value to the sender, but serviceable to others.

The late Mrs. Elizabeth Yocum Stevens began the work for the Red Cross during the war. Mrs. Mabel Frankenfield is now in charge of the Hospital Department. Her report shows a profit of $1400 a month. Clothes, rags, papers, etc., are acceptable.

Report of Deaths, by the Chairman of the Necrology Committee, Dr. Wm. Wenzlick.

In Memoriam.

1912-1913.

Henry Sayne Orme, A. B., M. D., Nov. 29, 1912.
Ralph S. Lavenson, M. D., July 4, 1913.
Edmund L. B. Godfrey, A. M., M. D., Dec. 17, 1913.

1914.

Alonzo French Huntoon, M. D., Jan. 12.
Abram Hostetter, M. D., Jan. 18.
Joseph Silas Baer, M. D., Jan. 19.
William H. Parker, M. D., March 18.
Chas. Byron Nichols, M. D., April 16.
Edmond Maynard Cohen, M. D., Aug. 3.
John Richard Colburn, M. D., Oct. 27.
Geo. W. Lasher, M. D., Dec. 4.

1915.

Jay S. Mehrary, M. D., March 5.
Francis Alvin Weir, M. D., April 15.
Frank Neall Robinson, M. D., May 24.
Archibald Robert Brown, M. D., June 11.
Chas. Warren Evans, M. D., June 14.
Frederick Thompson Bicknell, M. D., July 6.
Geo. W. Peck, M. D., Dec. 13.
Rose Talbott Bullard, M. D., Dec. 22.

1916.

John Evan Jenkins, M. D., Jan. 7.
Elbert Wing, A. B., M. D., May 4.
Andrea Porter Wilson, M. D., July 20.

1917.

Clyde Jason Elmer, M. D., Feb. 1.
Chas. Henry Whitman, M. D., June 14.
Peter Gregory Cotter, M. D., June 16.
Elizabeth Ann Follansbee, M. D., Aug. 22.
John Adams Colliver, A. B., M. D., Aug. 22.
Thomas Elmer Grubbs, M. D., Aug. 24.
Clair Warren Murphy, A. B., M. D., Nov. 24.
Theodore Gawn Finley, B. S., M. D., Dec. 14.

1918.

Frank W. Thomas, A. B., M. D., Jan. 12.
Edward Arbo Tromwald, Ph. C., M. D., Feb. 17.
Henry Backman Stehman, A. M., M. D., Feb. 17.
James William Shaul, M. D., Feb. 21.
Chas. Goodrich Shipman, M. D., April 9.
Lieut. Edward Treadway, A. B., M. D., May 19.
William Sumner Clark, M. D., June 4.
John Miller Stephens, A. B., M. D., July 9.
Wm. Bradford Bullard, M. D., Sept. 23.
Chas. G. Dawley, M. D., Oct. 9.
Nellie S. Hayes, M. D., Oct. 11.
Joseph William Stone, M. D., Oct 16.
Edgar Mosher Allen, M. D., Oct. 21.
Chesley Lightbourne Evans, M. D., Oct. 25.
Lieut. Wayne Pierre Hanson, M. D., Oct. 26.
Capt. Harvey L. Thorpe, M. D., Los Angeles, Nov. 4.
Lieut. Carl Adolph Breitling, M. D., Nov. 5.
Lieut. Col. Wm. Emmet Purviance, M. D., Dec. 26.

Deaths for the year 1919.

Asst. Surg. Harry Virgil Bogue, M. D., Jan. 9.
Charles Frederick Miller, M. D., July 22.
Frederick J. Kruell, M. D., July 29.
Thomas J. McCoy, M. D., Sept. 30.
Cynthia A. Skinner, M. D., Oct. 3.
Ernest Eugene Roberts, M. D., Oct. 11.
Charles W. Fish, M. D., Nov. 25.

Summary.

Accidents, 7.
Tuberculosis, 7.
Influenza, 7.
Pneumonia, 7.
Cardiac Diseases, 5.
Cerebral Hemorrhages, 4.
Angina Pectoris, 3.
Carcinoma, 3.
Appendicitis, 2.
Septicaemia, 2.

In six years total deaths were 54 out of a membership of about 600, increasing to about 900 by January, 1920.

MENDOCINO COUNTY.

The yearly meeting should have been held on December 10th, 1919, at Willits but heavy rain storms visited the valleys on that day, making it impossible for most of the members to attend. The slim attendance decided to lay the yearly proceedings upon the table and to adjourn to our next regular meeting. After adjourning Dr. and Mrs. Griner of Willits entertained those present, first at a banquet at Hotel Willits and later at their cozy home.

At the meeting held in the office of Dr. O. H. Beckman, Fort Bragg, on January 21st, 1920, the postponed yearly proceedings were taken up. The minutes of the last yearly meeting were approved and the secretary's yearly reports on membership and finance.

The officers elected for 1920 are President, Samuel L. Rea, M. D., Ukiah; Vice-President, Homer H. Wolfe, M. D., Albion; Secretary-Treasurer, Oswald H. Beckman, M. D., Fort Bragg; Ass't Editor, Oswald H. Beckman, M. D., Fort Bragg; Delegate, Frank M. L. Campbell, M. D., Fort Bragg; Alternate, to be appointed.

The membership report brought to light that we still have one member on active duty in the Navy, Lt. Reuben H. Hunt, M. C., U. S. N.

The meeting was capped by a very sociable lunch.

ORANGE COUNTY.

The regular January meeting of the Orange County Medical Society was held in the Santa Ana Library building. The Society was entertained by a paper by Dr. D. F. Royer, of Orange, entitled "The Cause of Diseases of Women." The doctor's paper provoked quite a discussion. Dr. Zaiser, Superintendent of the Orange County Hospital, invited the Society to hold their meetings regularly in the chapel where ample room and accommodation was available. The Society thanked the doctor for his kind offer and decided to meet with him in the month of February when the matter will be taken up and considered further.

The regular February meeting of the Orange County Medical Society was held in the chapel of the Orange County Hospital at Orange. Dr. Zaiser arranged the program for the meeting which was clinical in character. The program consisted of the presentation of cases and the reading of papers as follows: "Primary Carcinoma of the Liver," by Dr. C. D. Ball; "Corneal Ulcer," by Dr. G. M. Tralle; "Cataract," by Dr. C. H. Brooks; "Polio-encephalitis," by Dr. J. I. Clark; "Traumatic Epilepsy with Stereoscopic Roentgenograms Showing a Bullet Lodged in the Brain Tissue," by Dr. W. H. Wickett.

The following four physicians were elected to membership in the Society: Drs. Lane, Ashworth, Ewing and Mayes. The matter of accepting the use of the chapel of the County Hospital for further meetings was not discussed. At the close of the meeting Mrs. Zaiser and Miss Swall, Superintendent of the Hospital, served delicious refreshments.

SACRAMENTO COUNTY.

At the January meeting of the Sacramento Society for Medical Improvement the following officers were elected: President, Dr. W. A. Beattie; Vice-President, Dr. G. A. Briggs; Secretary and Treasurer, Dr. Harold Zimmerman. As Associate Editor of the Journal Dr. S. E. Simmons has been appointed.

SAN DIEGO COUNTY

The County Medical Society Bulletin appears this year in a new and much improved garb; it also makes its appearance twice a month, and is apparntly paying its way from the array of legitimate advertising that appears in its pages.

A very interesting session of the Society was recently held conjointly with the bar association. After an enjoyable repast at the Hotel San Diego the evening was punctuated with eulogies, serious and comic, of the two professions, while shafts of mirth and criticism, some barbed, some velvet encased, sped swiftly back and forth. From this scene of battle emerged groups of professional men with both their sense of humor and tolerance of their fellow man thoroughly stimulated, while many a scintillating remark possibly expressed in humor left food for serious thought for many a day. All expressed the meeting of definite cultural value and hoped it might be repeated at least once a year.

The evening of January 13th featured an excellent paper by Dr. H. C. Oatman on acute dilatation of the stomach, which furnished some valuable discussion on one of the most interesting as well as one of the most alarming post-operative emergencies, by Drs. Churchill, Burger, Pickard, Clark and Oatman.

The epidemic of mild influenza which has greeted San Diego during the last few weeks seems to be definitely on the wane. The physicians have characterized the disease as of mild type, comparatively free from fatalities. Prompt action by the local health officer supplemented

by an advisory committee from the Medical Society might have had not a little to do with the rapid fall of the disease.

Dr. Martha Welpton, after a year's service in public lecture work for the Red Cross, has reopened her office in the First National Bank Building, with practice limited to gynecology and obstetrics.

Dr. Chas. W. Brown, recently of the Navy, has opened an office in the First National Bank Building, limiting his practice to ear, nose and throat.

Dr. Leon DeVille has returned to San Diego and opened an office in the Timken Building.

Dr. Edgar A. Frauer, after post-graduate work in G.-U., has opened an office in the First National Bank Building.

SAN FRANCISCO COUNTY

Society Meetings

Proceedings of the San Francisco County Medical Society

During the month of January, 1920, the following meetings were held:

Tuesday, January 6—Section on Medicine.

Election of Section Officers for 1920.

1. Orthopedics in relation to medicine.—E. H. Smith.
2. Infections of the female urethra.—C. B. Moore.
3. Reports and radiograms of some interesting kidney conditions.—S. A. Goldman.

Tuesday, January 13.—General Meeting

1. Aims of the American Legion.—Mr. J. C. Colman.
2. On stereographic radiograms, localizing by visualization of the skin. Illustrated by lantern slides.—H. D'Arcy Power.
3. Physiological effects of high altitudes with especial reference to the work of the Medical Research Laboratory, Air Service, U. S. Army.—J. L. Whitney.

Tuesday, January 20—Section on Surgery

San Francisco Polyclinic Clinical Evening

1. Tumors of the pelvis of the kidney.—W. E. Stevens.
2. Some aspects of malaria.—Bernard Kaufman.
3. Intestinal obstruction.—B. S. Stevens.

Tuesday, January 27—Section on Eye, Ear, Nose and Throat

1. Demonstration of cases and new methods.—Harold Fletcher. Hans Barkan and F. C. Cordes.
2. X-ray indications for mastoid operations.—H. B. Graham.
3. New eye tests for admission to the Air Service.—Percival Dolman.

Election of Section officers for 1920.

Obituary

HENRY KREUTZMANN

San Francisco

Hamlet, . . . "yet it will come; the readiness is all."

He was born February eighth, eighteen hundred and fifty-five. He came to San Francisco in eighteen hundred and eighty-six. He died in nineteen hundred and twenty. Thus, at this time he was sixty-five years of age.

He was a learned man striving to do a great good. At no time throughout his long, useful life did he lose contrition.

His daily conduct was like unto a deep, calm lake, reflecting a tense sense of professional obligation.

It was his proud and proper boast, and our knowledge, that of all the women he attended he never lost one in or after childbirth.

At the solemn ceremony I watched the rich and poor pass his dead face. No curiosity, common to the last look, held them. Theirs was heart-felt grief and silent gratitude for noble service rendered.

There is a book whose cover, in the very beginning of time, was made glorious by the hand work of the High Priests of Medicine. Its brazen hasp closely holds the life leaves of splendid men and we lesser ones open it and read and gain inspiration.

IT IS IN THIS BOOK WE JUSTLY PLACE THE PAGE OF HENRY KREUTZMANN.

SAN JOAQUIN COUNTY

The first regular meeting of the year 1920 of the San Joaquin County Medical Society was held in the Green Room of the Hotel Stockton on Friday evening, January 9th. Those present were: Drs. C. F. English, B. J. Powell, F. J. Conzelman, C. D. Holliger, L. Dozier, H. Smythe, L. R. Johnson, C. R. Harry, E. A. Arthur, Will Priestly, A. E. Edgerton, L. Haight, S. F. Priestly, S. E. Latta, H. E. Sanderson, Mary Taylor, J. T. Davison, R. B. Knight, W. T. McNeil and D. R. Powell, with Dr. H. B. Graham as guest and speaker of the evening.

The Committee on Admissions reported favorably on the application of W. P. Lynch of this city. Upon motion made and seconded the report of the committee was accepted and Dr. Lynch was declared a duly elected member of the society.

Dr. Arthur presented an interesting case of a cerebral hemorrhage and a hemiplegia with high blood pressure in which the most interesting thing was the complete recovery from paralysis in a short period of time.

Dr. F. J. Conzelman of the State Hospital Staff presented in a most complete and thorough way an interesting case of subcortical motor aphasia. The patient could recognize objects, could obey commands, could read and write but was dumb. There was also a right hemiplegia present. The doctor discussed from the standpoint of a differential diagnosis the possible cause for this condition and told why he felt it was due to an embolus from a valvular heart condition.

Dr. Powell spoke of an interesting case of a calculus in the submaxillary duct which was coincidental with an acute otitis media.

The paper of the evening was presented by Dr. Harrington B. Graham of San Francisco on Plastic Surgery of the Nose. The Doctor first spoke of the saddle nose type and told of the danger of paraffine injections in inexperienced hands, but stated that he had had some very successful results. He spoke of cartilage and bone transplants as the best way of building up these cases. He also spoke of the hump nose and the methods of rasping the bone and told of the single stroke refracture in the case of lateral displacement. The Doctor showed numerous photographs of various cases before and after operation which proved conclusively the benefit the patient had derived from the procedure.

After some discussion by the members present the meeting adjourned to the White Room where refreshments were served and a social hour enjoyed.

SANTA CLARA COUNTY

At the annual meeting for the election of officers the following men were chosen:

President, Dr. Thos. L. Blanchard; first vice-president, Dr. E. F. Holbrook; second vice-

president, Dr. G. P. Hall, Sunnyvale; Third Vice-president, Dr. Robert L. Hogg, Saratoga; treasurer, Dr. H. J. B. Wright; secretary, Dr. J. L. Pritchard. Councillors-at-large: Dr. A. E. Osborne, Dr. P. A. Jordan, Dr. J. J. Miller.

At the present time the Society has a membership of over 80. A great deal of interest is being manifested toward the League for the Conservation of Public Health. Dr. D. A. Beattie was named to represent the Society at the annual meeting of the league recently held in San Francisco, and at this meeting Dr. Beattie was elected a director representing the central counties in the league.

SANTA CRUZ COUNTY

The following have been elected officers of the Santa Cruz County Medical Society for the year 1920:

Dr. L. M. Liles, President; Dr. W. F. Cothran, First Vice-President; Dr. H. G. Watters, Second Vice-President; Dr. A. N. Nittler, Secretary-Treasurer; Dr. A. N. Nittler, Delegate; Dr. S. W. Dowling, Alternate Delegate; Dr. A. F. Cowden, Censor; Dr. W. F. Cothran, Censor; Dr. D. S. Woodard, Censor; Dr. J. C. Farmer, Corresponding Editor.

A new member was elected to the Society, Dr. T. F. Conroy, formerly of Chicago. Dr. H. E. Piper, last year of San Francisco County Medical Society and a former member of this Society, was reelected.

TULARE COUNTY

Regular meeting of the Tulare County Medical Society was held at Hotel Johnson, Sunday evening, January 25, with Dr. W. A. Sprik of Los Angeles as the guest of the evening.

After the dinner Dr. Sprik discussed gastric ulcer from the many different angles which they present to the general practitioner, dwelling upon their amenability in a large proportion of cases, to suitable medical treatment.

In the general discussion which followed many points of great interest were made clear. Dr. S. A. Barber of Porterville, who has been at Lane hospital with a fractured patella for the past six weeks, has resumed his practice.

Dr. F. V. Emery, for the past five years a practitioner at Porterville, has been appointed assistant physician at the Sonoma State Home, Eldridge.

Dr. C. L. Morris, recently returned from service in France, has located at Porterville.

Kings-Tulare County Tubercular hospital at Springville was filled to its capacity five months after opening.

Notice

AMERICAN DIETETIC ASSOCIATION

The next annual meeting of the American Dietetic Association will be held in New York City, October 22, 23, 25 and 26, 1920. Plans under consideration now promise to make this one of the most worth while meetings of interest to all groups of people whose special work is allied with nutrition and dietetics.

Medicine Before The Bench

In this column will appear with appropriate comment, from month to month, court decisions and proceedings affecting the various phases of medical practice, the conduct of hospitals and the enforcement of public health laws.

DAMAGES FOR ALLEGED MALPRACTICE

A judgment of the Superior Court of San Francisco for $2000.00 against Dr. W. C. Eidenmuller, Jr., for alleged improper surgical and medical treatment administered to Otto Scherer was reversed by the First Appellate District Court Division Two, in a decision handed down by Judge Langdon, concurred in by Judges Brittain and Nourse.

In this action brought by plaintiff to recover damages for alleged improper surgical and medical treatment administered to plaintiff by a practicing physician, of a gunshot wound in his elbow, the evidence fails to establish negligence on the part of said physician not taking X-ray pictures of said wound at any time during a period of about 3 months and 10 days after an operation thereon, where said wound during said time showed signs of infection and was discharging pus, and the only expert testimony offered by plaintiff showed it was not improper to not take X-ray pictures where such condition existed.

The testimony offered in the lower court is discussed at length and the Appellate Court decides that "it falls far short of the proof required to establish negligence."

The respondent argues that because the defendant stated to the plaintiff about August 20th that he would take him to Dr. Stoddard for the second operation, because Dr. Stoddard had had more experience with such cases and had just returned from the war zone, and that he, defendant, had not had a case like this one before, this amounts to an admission of incompetency and unskilfulness upon the part of the defendant. We think these statements are susceptible of no such construction. As pointed out before, Dr. Coffey testified that in an experience covering 18,000 fracture cases he had never seen a case like this one. The defendant testified that he had had considerable experience in fracture cases, but had never had one precisely like this. The fact that Dr. Stoddard was admitted to be more experienced and skilled along this particular line does not imply that the defendant did not possess that reasonable degree of learning and skill possessed by others of his profession in his locality. This question is discussed in the case of Houghton v. Dickson, supra, where it is said that the fact that some other physician may have discovered a dislocation in an arm does not show a want of ordinary care in the defendant physician, since the physician who made the discovery may have been a man who, by reason of superior learning and advantages, possessed far more than ordinary skill in his profession. The court in that case quotes from the case of James v. Crockett, 34 N. B., 540, as follows: 'A surgeon does not undertake to perform a cure, nor does he undertake to use the highest possible degree of skill, as there may be persons of higher education and greater advantages than himself. . . .' Surely it will not be contended that the measure of ordinary skill is the amount of skill and experience acquired by physicians who have been working for some time in the war zone and handling a constant succession of difficult and unusual cases.

"Though the determination of the question herein discussed cuts the foundation from under the judgment in this case, it is pertinent to remark also that the record contains no evidence that it would have been possible or likely by any course of treatment, no matter how skilful, to have restored to the plaintiff the full use of his arm after an injury such as occurred here. The fact that a patient does not make a complete recovery raises no presumption of the absence of proper skill and attention upon the part of the attending physician. (Haire v. Reese, 7 Phila. (Pa.), 138, quoted in Houghton v. Dickson, supra.)

Department of Pharmacy and Chemistry

Edited by FELIX LENGFELD, Ph. D.

Help the propaganda for reform by prescribing official preparations. The committees of the U. S. P. and N. F. are chosen from the very best therapeutists, pharmacologists, pharmacognosists and pharmacists. The formulae are carefully worked out and the products tested in scientifically equipped laboratories under the very best conditions. Is it not plausible to assume that these preparations are, at least, as good as those evolved with far inferior facilities by the mercenary nostrum maker who claims all the law will allow?

On application the Collector of Internal Revenue will furnish a physician with a permit to prescribe distilled spirits (alcohol, whisky, etc.) and will furnish him with the necessary forms. Unless a physician has such a permit, it is unlawful for him to prescribe distilled spirits or to have any in his office. The permit allows the physician to purchase in any calendar year 6 quarts of distilled spirits (alcohol, whisky, etc.) for office use, but not for personal use.

The Council of Chemistry and Pharmacy of the A. M. A. calls itself a clearing house for pharmaceutical preparations. It seems better to call it Tribunal, for it judges all preparations submitted to it strictly on merit without fear or favor, and its decisions are not influenced by prestige, wealth, threats or ridicule. It is not infallible and it must not, therefore, be assumed that all of the preparations accepted for N. N. R. will absolutely do what they pretend to do in all cases, or that preparations rejected are, necessarily, dangerous, fraudulent or even without some clinical use. However, the physician may feel perfectly safe in at least trying preparations that have been accepted and he should be extremely careful before prescribing those that have been rejected.

A study of the prescription files in any reputable pharmacy will show an alarming number of prescriptions calling for preparations that have been condemned and again condemned by the Council of the A. M. A. and these prescriptions are frequently written by men of standing and reputation whose knowledge of medicine and ethics are above reproach. It seems that this should not be so after almost a quarter of a century of good work by the Council, but it will be so until all medical colleges and especially our best medical colleges insist that their graduates have a working knowledge of the principal drugs and preparations of the U. S. P. and N. F. and know how to write prescriptions for them.

Approval by the Council of some standard drug of a particular make such for instance as Barbital (Jones) or Benzyl Benzoate (Smith) does not indicate that the drug of this make is superior to all others, but simply that it comes up to the standard set by the Council.

The Treasury Department has modified the denaturance which must be added to alcohol before it can be sold to the public. It is no longer permissible to sell alcohol with 4/10 per cent. of formaldehyde. Every hobo soon learned how to neutralize the formaldehyde and stores which had been selling five gallons of alcohol a month suddenly sold five barrels or more. Alcohol can still be sold with two per cent. formaldehyde and two per cent. glycerine added. If this formaldehyde is neutralized the resulting product will be too active for comfort. However, the two per cent. formaldehyde makes it unfit for rubbing. One per cent. carbolic acid is no longer permitted. Alcohol may now be sold containing 1 to 2000 mercury bichloride. This is also unfit for rubbing. The best formula now in use is probably that requiring the addition of one per cent. liquor cresolis comp. The physician can prescribe one pint of alcohol under the same conditions as one pint of whisky.

Manufacturers of the so-called "soluble Iodides" claim that their preparations are better than U. S. P. tincture of iodine in that the iodine is not precipitated on mixing with water and that the potassium iodide in the tincture of iodine causes irritation. Careful examination has shown that some of these preparations contain Hydriodic acid which is more irritant than potassium iodide and that if the iodine content is taken into account, these preparations are more irritant than either U. S. P. tincture of iodine or Lugol's Solution. U. S. P. tincture of iodine is miscible with water so that there is absolutely no reason for the existence of these soluble iodides. Certainly no reason why the patient should pay four or five times as much for it as for U. S. P. tincture of iodine.

An examination of ipecac preparations shows that Salol coated tablets or capsules may be so poorly or lightly coated that the ipecac affects the stomach or they may be so heavily coated that they are not dissolved in the intestines. If properly made, however, they seem to work very well.

Emetin Bismuth Iodide dissolves to some extent in the stomach and sometimes causes derangement. Al Cresta Ipecac tablets which contain Ipecac Alkaloids with Fuller's Earth, do not always dissolve in the intestines so that there is apparently no absolutely reliable preparation of this kind on the market.

The Direct Sales Co. of Buffalo is a type of the concerns which seems to exist because they fear that the physician may be exploited by well known pharmaceutical houses and therefore sell him tablets, etc., for dispensing at greatly reduced figures. An examination of a number of their tablets show that they contain only a fraction of the drug indicated on the label. The physician who does his own dispensing owes it to himself and to his patients to give them what he thinks he is giving them and he should, therefore, use only preparations of reliable manufacture. All reliable manufacturers examine their products very carefully and though, occasionally something does get out which is not up to par, this rarely happens. It is well to remember that a tablet machine, a printing press and a slick detail man do not make a reliable pharmaceutical house.

Examination has been made of a number of tablets which are claimed to liberate formaldehyde in the mouth and that these, therefore, sterilize the throat. Even if formaldehyde were liberated, the quantity sufficient to sterilize the air passages would be too irritant to use.

The manufacturers of Pineoleum have issued a circular from which it appears that Dr. Chas. Lambert, President of the A. M. A., has endorsed their product. Dr. Lambert wishes it distinctly known that he has never used and, therefore, never endorsed Pineoleum. There should be some law against this kind of advertising.

Olive oil acts as a laxative only when the quantity used is so great that a portion passes through without being digested. It is indicated in some cases but contra-indicated in so many more, that care should be taken in prescribing it.

The work of Acroflavine and Proflavine is still in an experimental stage. Of 34 reports from various clinics, 25 were favorable, 7 unfavorable and 2 uncertain.

The Council has refused to admit Medinal to the N. N. R. as it is simply a sodium salt of Barbital and therefore not essentially different from Sodium Barbital. As it is only a sodium salt of Barbital, the claims made for it seem unwarranted.

Pneumonia Phylacogen and various other vaccines have been used as prophylactics for in-

fluenza. The general opinion of those best qualified to judge is that vaccines and serums are of little or no use and that some of them may even be dangerous.

A committee which examined the action of various lactic ferments has come to the conclusion that while fermented milk is useful in some cases, that it is probably impossible to plant these bacillae in the intestines when they are taken in the form of tablets or suspended in water. Bacteriologists and scientists on the Committee were much more positive in this matter than the clinicians. It must be stated that many clinicians in hospital and general practice insist that the tablets or suspension are frequently efficacious.

Antimeristen (Schmidt) is apparently the first German product to be extensively advertised to the physician since the armistice. Several years ago the Council reported that the claims made for this were unwarranted and there seems no reason for changing this opinion. We shall probably again soon be flooded with German products and German literature and it is to be hoped that American physicians will be more discriminating than many have been in the past.

Luminal is a phenyl barbital or veronal which seems to be useful in some nervous affections. The dose actaully found safe in practice is 1 to 2 grains once or twice a day. Much of the literature on this article states that the dose is from 5 to 10 grains. This seems to be a dangerous dose as several cases have been reported in San Francisco and vicinity where 5 or 6 grains of luminal put the patient to sleep for 24 hours or more. This may be due to idiosyncrasy, but physicians should be careful to test their patients before ordering more than 1 to 2 grains as a dose.

Clinical Department

CASE HISTORIES FROM THE CHILDREN'S DEPARMENT, UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL AND HOSPITALS.

Case No. 3. October 13, 1915. Female, American. Age 8 years. No. 10094. D. E.

Complaint: "Pain in stomach."

Family History: Father, four brothers, and three sisters living and well. Mother suffers from chronic chorea. Otherwise family history entirely negative.

Past History: Normal birth and development. Pertussis at the age of 3 months. Mumps at the age of 3 years, and pneumonia at the age of 2½ years. Otherwise the past history, except that directly referable to the present condition, is negative.

Present Illness: The child was in excellent health until approximately 1 year before entry (at the age of 5 years) when she was suddenly taken ill with acutely reddened, tender swellings of the knees, ankles, wrists and elbows. She was confined to bed for one month, and then apparently entirely recovered, except for very slight choreiform movement which persisted for a short period. One month before entry, she suffered another similar attack, which again confined her to bed. Two days before entry severe generalized, inconstant abdominal pains became a symptom. There was no hemoptysis or epistaxis. There was very slight, if any dyspnoea, although careful questioning elicited the fact that ever since her first attack, she had been accustomed to sleeping with at least two pillows elevating her head.

At entry the temperature was 38², pulse 140, respirations 28.

Physical Examination: A well developed and nourished child, anaemic, slightly cyanotic, showing moderate dyspnoea which becomes marked when the head is lowered. The skin shows a few petechial hemorrhages over the chest and abdomen.

Head, Eyes, Eye Muscles, Ears: Negative. There is a sero-sanguinous discharge from the right nostril. Buccal mucosa cyanotic.

Teeth: Very badly carious.

Tonsils: Much enlarged and cryptic. Moderate general cervical adenopathy.

Chest: Slightly prominent in region of lower sternum, somewhat more marked on the left.

Lungs: Negative.

Heart: Apex impulse not seen but felt 7 cm. to the left, from the mid-line in the 5th space. Beat is diffuse and not definitely localized. No thrill. Dulness extends from the mid-line to the left 9 cm. in the 6th space, 11 cm. in the 5th, 11 cm. in the 4th, 4¾ cm. in the 3rd. To the right, the dulness extends 3¼ cm. in the 2nd space, and 7 cm. in the 4th. The cardio-hepatic angle is obtuse. The sounds show a marked sinus arrhythmia but are of fair quality. $A_2 = P_2$. They cannot be heard to the right of the sternum; best heard 1 cm. outside the nipple line in the left fifth space. Blowing systolic murmur heard best at the apex transmitted to axilla and back. "To-and-fro" pericardial friction rub heard at the base, fading toward apex and axilla, synchronous with systole and diastole. Radials equal, good volume.

Abdomen: Negative except for palpable non-tender liver edge 3 cm. below costal border.

The remainder of the examination was negative.

Laboratory Examinations: Von Pirquet, Wassermann in blood serum, Blood Culture, and Culture from pericardial fluid were all negative.

Blood Count: Hb. 70%, R. B. C. 4,950,000, W. B. C. 17,750. Differential: Polys 80%, Lympho 10%, Large Mono 3%.

Urine: Positive for acetone and diacetic acid. Otherwise negative.

Throat Culture: All types of cocci. No hemolytic streptococci.

X-Ray findings: "Large Pericardial Effusion."

Pericardial Puncture: Needle inserted 4 cm. from the right sternal border in the 5th space. 10 cc. of sero-sanguinous material were withdrawn for diagnosis.

Diagnosis: Rheumatic endocarditis and Pericarditis with effusion.

Discussion: During the first 48 hours several syncopal attacks occurred, but the orthopnea was so easily relieved by the sitting posture that aspiration of the periodical sac was not deemed necessary other than for diagnostic purposes, culture, etc. The effusion, too, began to be rapidly absorbed—within three days the area of dulness was appreciably less, and the heart shadow had lessened in size in the radiograph. Her temperature fluctuated in the neighborhood of 39° for three days and then dropped to normal. The pulse, however, showed wide variations for a month, then becoming much steadier. As the fluid was absorbed the endocardial signs became much more distinct, while, after a period of three months and extra-cardial (pleuro-pericardial) systolic murmur became distinctly audible, especially at the apex. (The occurrence of pleuro-pericarditis is unquestionably very frequent, in fact usual in these cases and there is great probability that many of the signs formerly ascribed entirely to adhesive pericarditis, between the visceral and parietal layers are in reality due to this condition.) At no time was a Broadbent's sign demonstrable, however. The child remained in the hospital for a period of six months, confined to bed entirely until the last three weeks of residence when she was allowed up for increasing lengths of time each day and also given graded exercises destined to

determine her cardiac capacity for work. During residence her teeth were placed in a healthy condition and one month after entry an adenotonsillectomy was performed with no ill toward effects. She suffered several attacks of acute coryza but at no time was there a reinfection of the cardia apparently. Three months after her entry her electro-cardiagram was entirely normal, and at the time of discharge, the examinations of the heart showed simply the presence of a chronic mitral regurgitation and the above mentioned pleuro-pericardial adhesions of slight degree. The pulse reaction to exercise and excitement was slight, the heart had hypertrophied but slightly, was fully compensated, and the radiograph was normal.

Medicinally, during the acute stage, aspirin was administered in 5 gr. doses every four hours. The use of the salicylates in rheumatic infections is variously regarded by different observers, many feeling that once the infection has taken place, little if any good is accomplished by their administration, and also that they are harmful from the depressant action on the myocardium. Others attribute this depression to the actual toxic influence of the infection, and therefore prescribe the drug in full doses during at least the period of greatest activity which was the plan followed in this case.

Tincture of Digitalis in tonic doses (m. III tid) was given after the first month continuously.

Pericardial puncture should be resorted to where pressure signs and symptoms are evident. Otherwise from the therapeutic standpoint it is not necessary. Opening and draining of the pericardial sac is a surgical procedure to be considered in the frankly purulent forms with many pressure signs and much toxicity.

Case No. 2 of this series demonstrates, with the present one, two very similar pictures, clinically, at the outset, but with entirely different etiology, course and outcome. Pericarditis is practically always secondary—a blood infection or one by direct extension. The former is exemplified in these two cases, the one being septicemic (staphylococcic) secondary to an abscess, with sero-purulent exudate, violent toxicity, with pyemic tendencies and rapid death; the other septicemic (rheumatic, probably streptococcic) secondary to an attack of acute rheumatic fever, with less toxicity, sero-sanguinous exudate which was rapidly absorbed and ultimate recovery.

The rheumatic form is probably more common, and from five to twenty-five years rheumatism is especially prone to cause pericarditis. Endocarditis is always present as is myocarditis. Upon the latter, to a very large extent, depends the course of the disease. The ultimate outcome also, in case of recovery, depends upon the extent of this myocardial damage, but also upon the amount of adhesive pericarditis which has resulted—this varies from obliteration of the pericardial cavity, with its interference in the cardiac action, to small bands or excrescences on the pericardium which cause little if any trouble.

The symptomatology is varied, but the most of the symptoms and signs are demonstrated in these two cases. Many of the attacks of pericarditis occurring in the course of other diseases, e. g., pneumonia, are undoubtedly missed entirely.

The prognosis varies with the severity of the infection and its type, as is demonstrated by the cases submitted. It is much worse in the sero-purulent forms than in the sero-fibrinous, the latter being typical of the rheumatic type of infection.

Balfour says, "Pericarditis, like other acute inflammations occurring in an otherwise healthy individual, may be expected to run a favorable course if not unduly treated."

State Board of Medical Examiners

COLLECTED CLIPPINGS ON MEDICAL LAW ENFORCEMENT

Lila Atherton, nurse, Los Angeles, arrested Jan. 21, 1920, by Sp. Agt. O'Connell, charged with the murder of Elsie Allen who died in the San Antonio Hospital, Uplands, from an illegal operation, alleged to have been committed by Mrs. Atherton.
L. A. Examiner, 1/2/20.

Special Agt. Castellaw reported criminal abortion charge pending against above in Superior Court, L. A., on Jan. 1, 1918.

John Lafayette Berry, whose license to practice in California was revoked by the Board of Medical Examiners at the Oct. 1919 meeting, has been granted a writ of review by Superior Judge Cabannis of S. F. who will pass on the right of the Board to revoke the license.
S. F. Examiner, 12/27/19.

The Christian League of Healing and Helpful Service was organized in Los Angeles Jan. 13, 1920, which is expected to show to the faithful and faithless alike that "the prayer of faith shall save the sick." L. A. Examiner, 1/11/20.

Chiropractors of Alameda County incorporate "to advance the science of chiropractic and to acquire the cohesive forces necessary to establish proper professional recognition." (None of the six directors are licensed to practice in the State of California). Oakland Tribune, 1/9/20.

The preliminary hearing of A. P. Francis of Oroville, charged with violation of the medical act was postponed to February 3rd, the defendant arguing the matter was within the jurisdiction of the Justice Court while attorney for the Board of Medical Examiners held the jurisdiction to lie in the Superior Court. Sacramento Bee, 1/23/20.

R. J. Framer and Simon Muller, chiropractors recently arrested in San Francisco for violation of the medical act were held to answer in the Superior Court by Police Judge Morris Oppenheim.

An application of Dr. Thos. F. Glass for a writ of Review, directing the Board of Medical Examiners to restore his license, revoked February 20, 1918, was denied in Judge Jackson's Court in Los Angeles, January 6, 1920. Dr. Glass advertised a tuberculosis treatment.
Los Angeles Express, 1/6/20.

H. O. Hanna, chiropractor, was acquitted of the charge of practicing without a license in Police Judge Mortimer Smith's court, Oakland, on January 22, 1920. After the verdict had been rendered three of the jurors stated they were convinced that the accused practiced without a license but they did not believe him guilty. Attorney George Gelder, former assemblyman, defended Hanna. San Francisco Examiner, 1/24/20.

"Dr." Ottoman Zar Adusht Hanish who in 1904 worked as a printer in Salt Lake under the name of Herr Otto Hanisch was recently arrested in Chicago after a search of a year or more and returned to Los Angeles to stand trial under indictment for revolting offenses against little girls.
Los Angeles Times, 12/31/19.

A. B. Hinchley and H. A. Brown, choropractors of Richmond, recently arrested and charged with violation of the medical act expect to make a test case as to the rights of chiropractors to practice.
Oakland Tribune, 1/21/20.

In 1916 the U. S. Supreme Court upheld the constitutionality of the California medical act, in an appeal filed by P. L. Crane, drugless practitioner of Los Angeles and argued before the Supreme Court, December 12, 1916.

"If sick and in trouble I will pray for you gratis. Unknown. Box 18015, Tribune," is an advertisement in the Oakland Tribune of January 22, 1920.

What pays for the cost of advertising if treatment by prayer is "gratis"?